E-LLISON PUSHES E-BUSINESS Oracle partners with Qwest on e-business service. Page 8.

NHL SCORES WITH DOMINO Groupware serving up everything from scoring stats to contract info. Page 15.

The newsweekly of enterprise network computing

NetworkWorld

June 7, 1999 Volume 16, Number 23

The network portal: www.nwfusion.com

TCO tall tales

Vendors' total cost of ownership figures seem to be based more on fiction than fact.

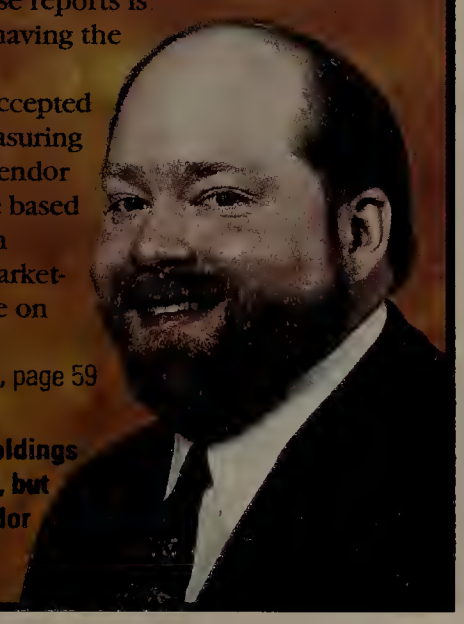
BY NEAL WEINBERG

If you ask each of the top network vendors what separates them from the pack, the answer you're likely to hear is that they alone can offer the best total cost of ownership (TCO).

Looking to sort out the real deal, *Network World* asked the vendors to back up their TCO claims with cold, hard facts and figures. 3Com and Cisco produced reports which, not surprisingly, placed each at the head of the class. Both vendors used data from the same analyst firm to bolster their cases. Nortel Networks wouldn't share its documentation, while Cabletron refused to participate at all. And one marketing manager admitted that whoever writes the check for those reports is pretty much assured of having the facts fall his way.

In the absence of any accepted industry standard for measuring cost of ownership, the vendor TCO stories appear to be based more on buzzwords than benchmarks, more on market-speak than metrics, more on fiction than fact.

See **TCO tall tales**, page 59



Jim Barry of Insurance Holdings of America looked at TCO, but ended up selecting a vendor based on other criteria.

Cabletron moves on

Co-founder Benson hands over CEO reins in an effort to refocus the firm.

NetworkWorld Q&A

Craig Benson, the embattled chairman, president and CEO of Cabletron Systems, resigned last week from the company he co-founded in a New England garage more than 15 years ago.

Benson is passing the CEO torch over to Piyush Patel, Cabletron's senior vice president of worldwide engineering and former CEO of YAGO Systems, a router start-up that Cabletron acquired last year.

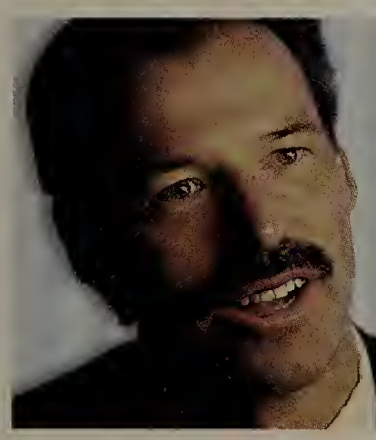
Benson shares some departing thoughts with *Network World* Senior Editor Jim Duffy.

What prompted your resignation?

Three things: Piyush is extremely capable and has had tremendous success in his past life at Cabletron, YAGO, Sun and Intel. And the network world is changing. It's now more toward the service provider marketplace.

That's not to say we're abandoning the enterprise, but a lot

See **Cabletron**, page 89



"It is time for me to step aside and turn the reins over to someone who can lead the company into the new millennium."

Craig Benson, former president and CEO of Cabletron

Online • Join our forum on what Benson's departure means for Cabletron.

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SHAWN HENRY

Active Directory users could learn from NDS

BY JOHN FONTANA

Network administrators moving to Microsoft's Active Directory should find some tips and comfort in the annals of technology.

Roughly six years ago, Novell sprang its Novell Directory Services (NDS) on legions of faithful NetWare users. What followed was sometimes chaotic and frustrating, but ultimately rewarding.

See **Directories**, page 88

Hot carrier gear sparks new breed of services

Voice over DSL, DSL.Lite around the corner.

BY TIM GREENE

ATLANTA — Dozens of service providers and their equipment suppliers will gather this week to show off the latest in digital subscriber line (DSL), optical networking and voice/data convergence technologies.

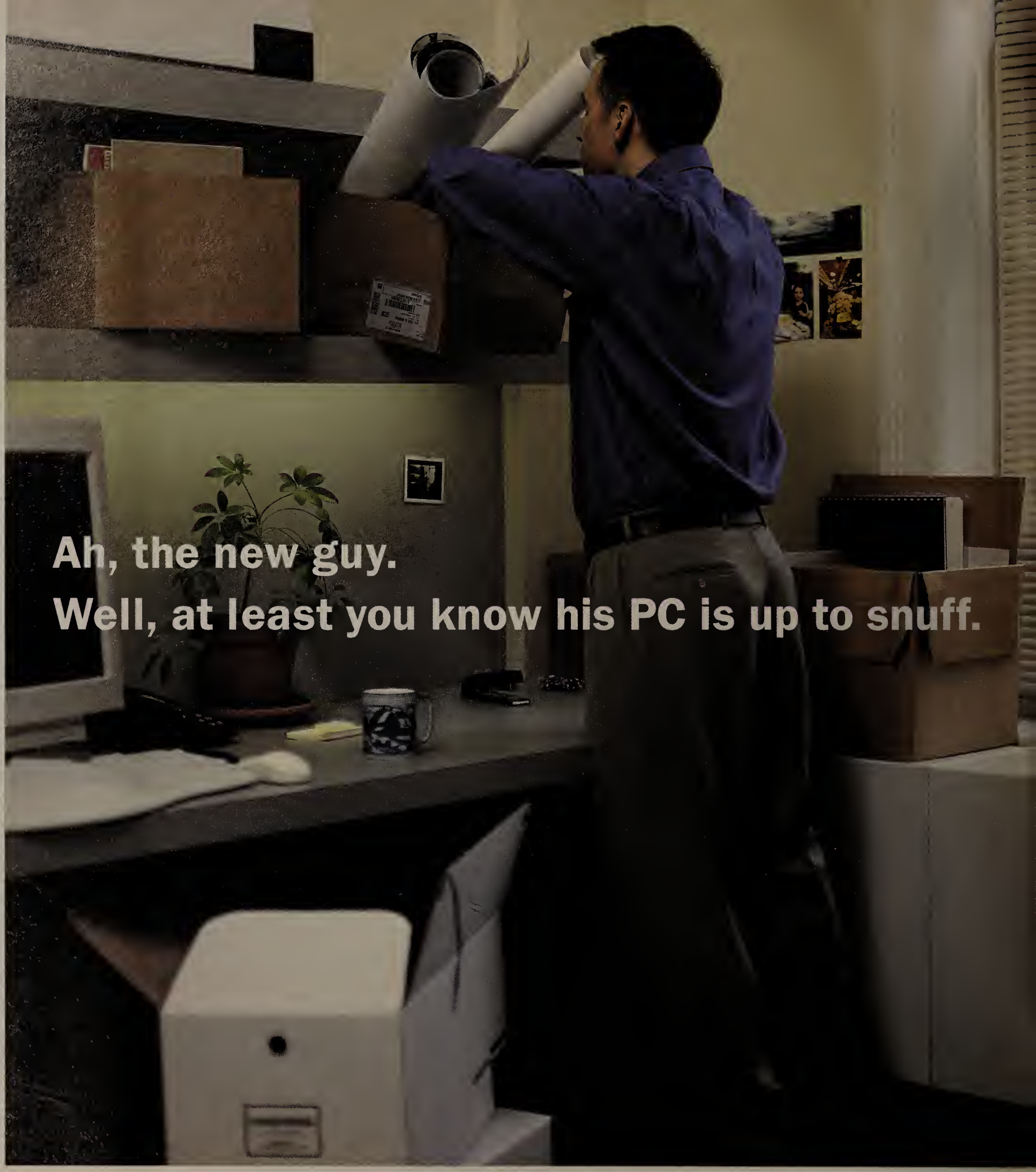
SUPERCOMM '99 Preview

The good news for users is that after months of hype, real services based on these technologies will soon be available.

Industry observers say this year's SuperComm conference in Atlanta may be the busiest one ever in terms of new technologies, product announcements and interoperability demonstrations.

Established equipment makers and well-heeled start-ups

See **SuperComm**, page 88



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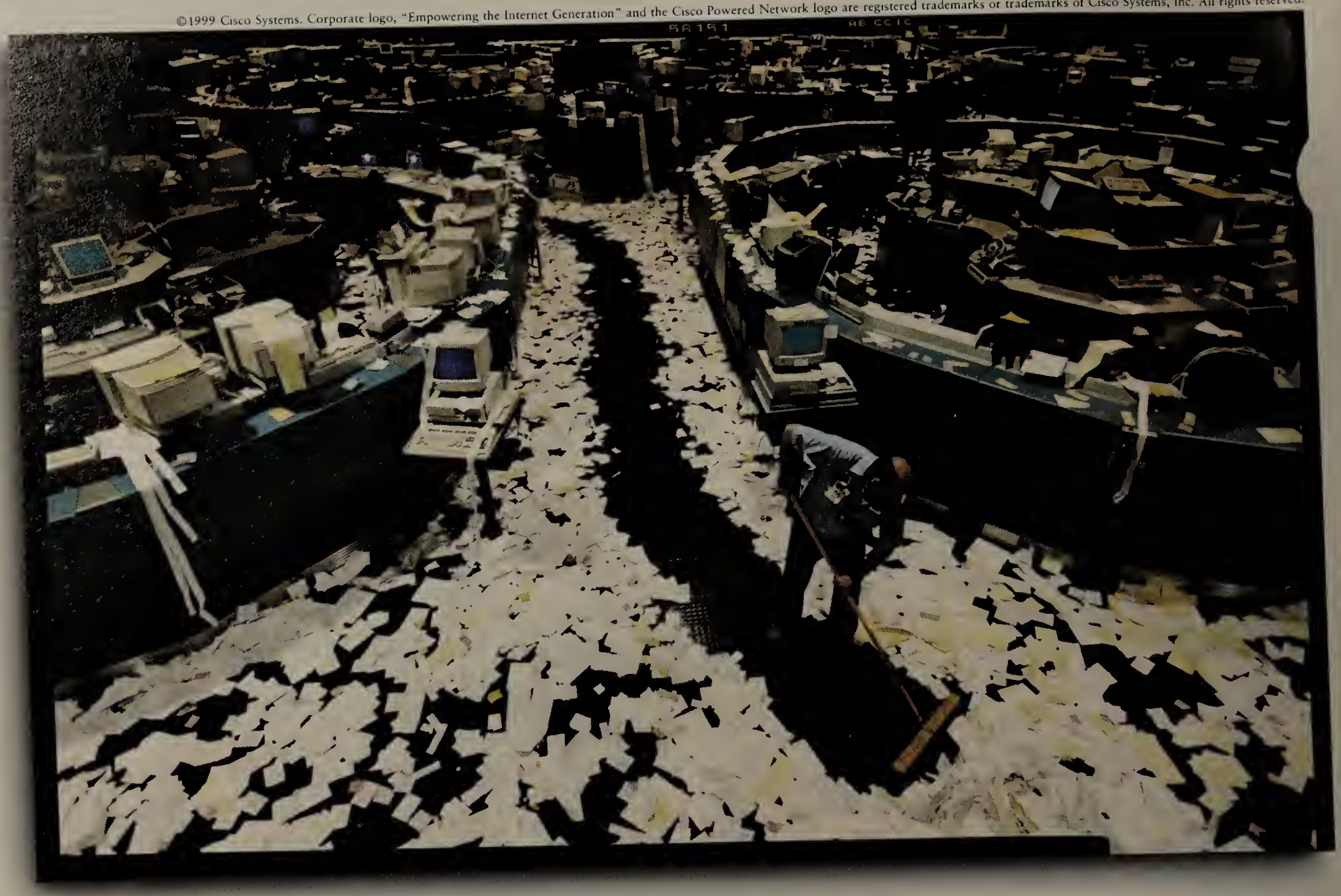

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NetworkWorld

JUNE 7, 1999

THIS WEEK ONLINE

Keeping Current. Fred McClimans delves into the revamping of Alcatel. Does Bernard Daines have a legitimate gripe? Will Alcatel be able to compete in the enterprise and ISP gear market? How will the company gracefully integrate all its recent acquisitions? **DocFinder: 3235**

VPN security protocols. Last week's "Tech Update" sparked readers to ask for more information about virtual private network (VPN) security protocols. In response, Greg Marcotte, author of the article and co-founder of VPN vendor Altiga Networks, will be online this week to answer your questions about IP Security, Point-to-Point Tunneling Protocol and a host of other tunneling standards. **DocFinder: 3236.**

Water Cooler. Executive News Editor Doug Barney is mad as hell at those who write viruses. "String 'em up," he says. **DocFinder: 3237**

Online credit card fraud. As online electronic commerce transactions grow, so do the incidences of credit card fraud. Banks are fighting back by putting the pinch on merchants. But is that the answer? *Network World* Senior Editor Ellen Messmer spoke with a Visa International executive, and you might be surprised by the answer. **DocFinder: 3238**

NT nightmares. Has NT kept you up late? If so, here's your chance to share some of your comical and not-so-comical experiences with your peers. Head into our forum, and let us know what has stumped you about Microsoft's platform. **DocFinder: 3239**

How to get onto Network World Fusion

Click on Register on the home page and follow the instructions. Subscribers, keep your NWF number — highlighted on the front cover's mailing label — handy during registration. Nonsubscribers must fill out an online registration form.

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Service-level agreements meet the Internet. Page 38.

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FAX: (508) 270-8869; E-MAIL: nwcirc@nww.com;
STAFF: See the masthead on page 16 for more contact information. **REPRINTS:** (717) 560-2001

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REVIEW: SoftArc's FirstClass Intranet Server tops our test of three collaboration servers that offer e-mail, discussions and Web serving. **Page 63.**

COOL TOOLS: Adobe's Acrobat gets strong new features. **Page 66.**

NEWS BRIEFS, JUNE 7, 1999

Cisco gets off the hook

The Federal Trade Commission (FTC) has stopped investigating partnership discussions Cisco held last fall with Lucent and Nortel Networks, the router kingpin announced last week.

The FTC launched its probe in September and apparently was attempting to determine whether Cisco had engaged in collusion with Lucent and Nortel to divvy up the telephony equipment market (*NW,* Oct. 12, 1998, page 6).

"We're pleased with the FTC decision," says Dan Scheinman, Cisco's vice president for legal and governmental affairs and general counsel. "Cisco took the FTC's questions seriously and fully cooperated with this routine inquiry."

Is that anything like a "routine" IRS audit?

Nessie Web site-ing

Has searching for Waldo become child's play? Well, how about trying to spot the legendary Loch Ness Monster, a.k.a. Nessie? A new Web site from Loch Ness Marketing lets visitors with too much time on their hands watch live video of Loch Ness in the hopes of catching a glimpse of the lake's notoriously camera-shy inhabitant.

The site (www.lochness.scotland.net) uses about a dozen Web cams to continually stream views of the lake from different vantage points.

Users can send electronic postcards from the site as well as read up on recent Nessie sightings.

Bill's billions

Say what you will about the guy, but Bill Gates and his wife, Melinda, extended philanthropy to new heights last week by donating $5 billion to the William H. Gates Foundation, making it the third largest philanthropic organization in the U.S. *The New York Times* reported that Gate's gift was the single largest donation ever made by a living person. Of course, he's got the dough.

The other Microsoft trial

Lawyers for Microsoft and Bristol Technologies squared off last week in a crowded courtroom in Bridgeport, Conn., as Bristol's private antitrust action against the software giant got underway. One participant described the scene as looking like a Comdex show floor, given all the computers and software on display.

In its lawsuit filed last August, Bristol charges that Microsoft strayed beyond the bounds of fair business practices when it allegedly refused to renew Bristol's Windows NT source code license on reasonable terms.

Bristol makes Wind/U, software used to port Windows applications to other operating systems, including Unix. The company says it must have access to NT source code to build its product.

According to Bristol, Microsoft licensed its source code to Bristol because it believed Wind/U would help NT penetrate the workstation and server markets. Microsoft then effectively cut off Bristol's license when Microsoft's strategy called for it, sounding the death knell for Bristol, the suit claims.

Microsoft responds that Bristol is using the courts to unfairly gain an advantage over a competitor, Mainsoft, which makes a product similar to Wind/U.

As Microsoft paints it, the squabble between the companies is a contract dispute, and not about antitrust law.

Both Microsoft and Bristol said that the opening of the trial went well for them. . . . Would you expect anything else?

GTE thinks small about e-comm

GTE last week introduced new services for small businesses looking to set up shop online. GTE E-Commerce Solutions will provide the little guys with hosting services, technical support, marketing guidance and online security as they develop Internet businesses.

The cost of the package ranges from $40 per month for a business with up to 10 items for sale, to $80 per month for a company with 100 items, to $130 per month for a business with unlimited products.

The software application for the service is provided by Mercantec Corp.

GTE: (203) 965-2000

Heads up, Charles Schwab

Last week, two more brokerage firms, PaineWebber Group and Merrill Lynch, announced they will be jumping aboard the online trading bandwagon.

PaineWebber Group expects to have its Internet brokerage service in place by the third quarter, while Merrill Lynch says it should be up and running on the 'Net in July.

Obvious question: What took them so long?

Intel buying its way into telephony field

Company forking over $780 million for Dialogic.

BY DENI CONNOR

Intel's $780 million acquisition last week of computer telephony vendor Dialogic is the latest in a series of moves by Intel to expand beyond the increasingly low-margin microprocessor business.

Intel, which has acquired a handful of internetwork equipment makers and Internet firms in recent years, now has set its sights on the telecommunications market.

The company recently invested $200 million in carrier Williams Communications and earlier this year forged a relationship with Analog Devices, a maker of digital signal processors (DSP) for use in phones and other network devices.

puter telephony products and technologies that run on Intel processor-based PCs and servers.

"Intel has attempted to go out and build a whole series of competencies around its core skill set, which is making microprocessors. That makes sense to me. Dialogic is part of that," says Joe Osha, an equity analyst with Merrill Lynch in New York.

Osha compared the Intel/Dialogic deal to another acquisition announced last week: Texas Instruments' $445 million purchase of Telogy Networks, a maker of Internet telephony software.

Williams boosts Web hosting

Intel's other big telecom deal of late, its investment in Williams, is expected to boost the Web-hosting business that Intel introduced in April. Williams will supply Intel with the network infrastructure needed to deliver Web-hosting services from new data centers scattered around the world.

Separately, Intel aligned with Analog Devices in February to create a joint design firm in Austin, Texas, to develop low-cost DSPs.

DSPs are chips that convert analog signals to digital code in devices such as modems, telephones and fax machines. ◪

More than chips

A sampling of Intel's telecom- and Internet-related activities over the past year:

May 1998	• Joins Bluetooth, an open wireless communications initiative.
Oct. 1998	• Acquires Shiva, a remote access vendor.
Nov. 1998	• Buys iCAT, an electronic commerce vendor.
Feb. 1999	• Forms joint venture with Analog Devices, a maker of digital signal processors.
April 1999	• Announces intent to build Web hosting business.
	• Invests in Williams Communications.
June 1999	• Airs plan to buy Dialogic, a leading computer telephony vendor.

Intel's plan of attack

"Intel is trying to rapidly expand outside the mainstream processor market so it can maintain some margins," says Mark Corcoran, an analyst with D.A. Davidson of Portland, Ore.

Not only is Intel looking to generate revenue by selling new products, but the company also wants to sell new products that will generate more demand for Intel processors.

With the purchase of Dialogic, Intel will gain text-to-speech, fax, ISDN and com-

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Scaring customers into doing business on the Web

BY JOHN COX

REDWOOD SHORES, CALIF. — Oracle last week revealed a new marketing strategy to convince network managers to buy the company's products for e-business applications: fear.

"It's either e-business or out of business," declared Mark Jarvis, an Oracle senior vice president.

The dire warnings came as Oracle announced a partnership with Qwest through which business customers can use the high-speed, fiber-optic Qwest network to access the full suite of Oracle applications. In essence, Qwest becomes a service provider for Oracle Business Online, which lets corporate users rent Oracle's business applications suite.

E-business, at least as it is described by Oracle, is not simply transactions executed via a Web site, but the shifting of internal and external business processes to the Web.

Oracle executives also say the company has improved a package of applications and services, called FastForward, designed to help customers quickly adopt e-business technologies. The company is promising to have FastForward customers up and running on a new e business system at a fixed price within a fixed time period.

STEVE BORNS

Oracle's Ellison is practicing what he preaches.

Most FastForward applications can be up and running in less than three months, executives say.

Oracle has also added new Web-based procurement software to FastForward, allowing customers to order everything from paper clips to bottled water, as well as new Web-based manufacturing software that lets customers manage their suppliers.

Jarvis and other executives warned that companies would have to change almost all of their business processes — those dealing with customers and those dealing with back-end transactions — in order to outrun and outperform their rivals.

Not surprisingly, they also said that Oracle's existing database, application server, development tools and Web-enabled business applications are the most complete and advanced products for that transformation.

You might ask, "How do they know this?"

Because Oracle itself is already using its own software to change its business processes, according to CEO Larry Ellison.

Ellison said Oracle will save $1 billion in the next 18 months by shifting more business processes to the Internet. For example, all human resources and related processes have been shifted to an outside service provider, which runs Oracle's applications. Employees access information about benefits, payroll and other matters via a Web browser, and use forms to make an array of changes.

The cost of processing corporate expense reports has been cut from $25 to $15 or less, Jarvis said. ◪

Microsoft, Justice Department headed for Supreme Court, legal expert says

Rebuttal phase of antitrust trial underway; ruling could come early next month.

BY JOHN FONTANA

The U.S. government resumed its antitrust lawsuit against Microsoft last week, and one expert says the case is likely to land in the Supreme Court.

A hearing before the highest court could lead to a precedent in antitrust law within the IT industry, says Hillard Sterling, senior litigator for Gordon & Glickson in Chicago. Sterling, a nationally known antitrust lawyer, has been following the case since it began in October of last year.

"I don't think the Supreme Court will pass up a chance to decide how antitrust principles operate in the IT industry," he says.

Sterling says the ruling would have little effect on corporations that purchase software unless Microsoft is eventually broken into "Baby Bills," as some have speculated.

Sterling predicts that Microsoft will ultimately lose the current case and will appeal the ruling to the District of Columbia Circuit Court of Appeals.

The case is now in its rebuttal phase after a three-month hiatus and is likely to end in two to three weeks. Under this scenario, Judge Thomas Penfield Jackson in all likelihood would issue a ruling in early July.

Last week, the U.S. Department of Justice began calling the first of its three rebuttal witnesses. When the Justice Department has finished, Microsoft will call its three witnesses.

IBM's Gary Norris is expected to be the Justice Department's most significant witness. Norris negotiated IBM's Windows licensing agreements for its PCs.

In an earlier deposition, Norris stated that Microsoft threatened to retaliate against PC makers that offered IBM's OS/2 operating system. He also said Microsoft's royalty fees increased from $9 per copy for Windows 3.1 to $45.90 per copy for Windows 95 between 1995 and 1997.

Microsoft's side

Microsoft, on the other hand, is attempting to strengthen its claim that the operating system market is viable and competitive.

"Microsoft is behind the eight ball and needs a terrific rebuttal performance to solidify its position," Sterling says.

Microsoft's key rebuttal witness will be Richard Schmalensee, dean of the Massachusetts Institute of Technology's Sloan School of Management. Schmalensee testified earlier in the trial.

Microsoft also will call David Colburn, senior vice president for business affairs at America Online, and Gordon Eubanks, president and CEO of Oblix. Microsoft attorneys intend to question Colburn about documents prepared by AOL's investment bank, Goldman Sachs. The documents seem to contradict testimony from AOL CEO Steve Case as to the importance of Netscape's browser in last November's deal in which AOL bought Netscape.

Case said in testimony that the deal was made despite the browser, but the documents indicate the browser was an integral part of the purchase and, in fact, was to be enhanced to counter Microsoft's operating system.

The Justice Department and 19 state attorneys general last year sued Microsoft in federal court, alleging that the software giant has engaged in illegal business practices, including anticompetitive behavior in the Internet browser market.

The IDG News Service contributed to this story.

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Here are this week's questions. Enjoy.

1. Favorite non-technical magazine
2. Favorite singer or group of all time
3. Favorite network tool (How did this question slip in here?)
4. Most brilliant mind of the 20th century
5. Favorite vegetable (no politicians, please)

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Know your Network

Network Associates breaks out intrusion-detection software plan

BY ELLEN MESSMER

WASHINGTON, D.C. — Network Associates is planning a busy year for its Active Security product line. The company intends to add intrusion-detection and alert capabilities to its desktop antivirus software, and have its Sniffer product be able to warn managers when it senses trouble or mounting congestion on an intranet.

The company is also ensuring that the intrusion-detection software Cisco is adding to its routers and switches can send alerts to Network Associates' Event Orchestrator, the central management console that warns of trouble and coordinates an automated response to problems.

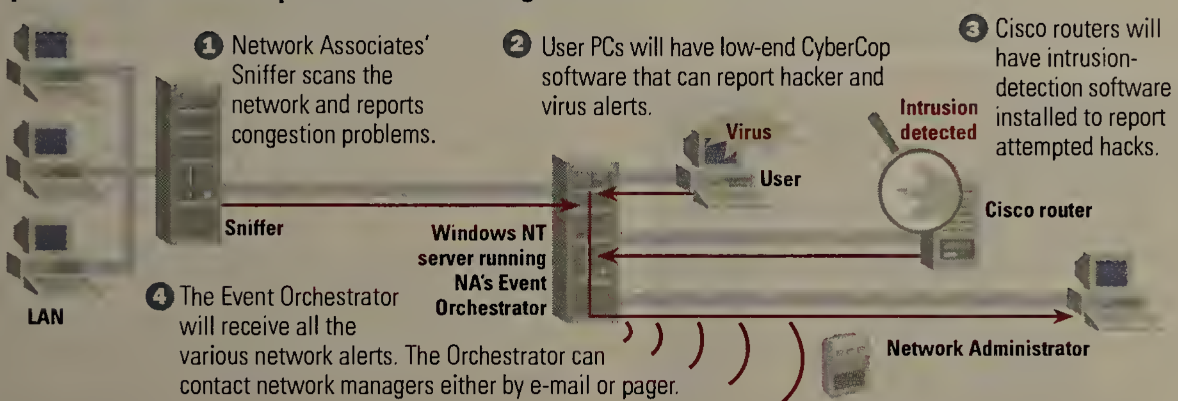
Cisco acquired its intrusion-detection technology when it bought start-up WheelGroup more than a year ago. A Cisco spokesman says the company will lay out its intrusion-detection roadmap soon, probably within the next few weeks. He notes there have been preliminary discussions with Network Associates on the sharing of security alerts from Cisco equipment, but that the discussions haven't reached the contractual stage yet. Cisco also says it is in similar discussions with at least five other vendors.

Network Associates was a bit more specific about its plans. "We're going to have these Cisco security Management Information Bases in our Event Orchestrator," says Peter Watkins, executive vice president for products and support at Network Associates. "The Cisco equipment will be checking for intrusions or denial-of-service attacks at the router or switch level. That's information that Event Orchestrator can use to coordinate a response to problems."

Currently, Event Orchestrator can only handle alerts issued from Network Associates security products. The alerts can notify a network manager or initiate an automated action, such as shutting down a firewall.

The future of net security

Network Associates plans to make its Active Security suite of products even more active by year-end. Much of the plan involves feeding more data into the console.



Antivirus software: desktop firewall?

As part of the evolution of Active Security, Network Associates is turning its desktop antivirus product, VirusScan, into a kind of low-end intrusion-detection product.

"Our CyberCop Monitor is looking at high-value host systems, such as servers with sensitive financial information," Watkins says. "But we figure people would like to deploy that kind of software on the desktop, too. Our antivirus software is already on the desktop, so we thought we would add intrusion detection to it so it could be looking for the 10 most common attacks, such as ping or password-hacking attacks."

According to Watkins, Network Associates' goal is to enhance the antivirus software so it will be a "personal firewall" that can be configured to send alerts about virus problems or hacker attempts to Event Orchestrator.

Sniffer is a network-diagnostic tool that lets net managers analyze traffic in terms of protocol usage. Network Associates plans to have Sniffer play a more active role by outfitting it to send back alerts to Event Orchestrator when network traffic starts to reach congestion levels. This ability will let managers take preemptive action. Eventually, Sniffer will be able to send alerts when it spots unusual patterns of traffic.

Orchestrating encryption

During a road show Network Associates held for government and industry in the Washington, D.C., area last week, Congressman Bob Goodlatte (R-Va.) let it slip during his keynote speech that the White House has purchased the Active Security suite.

The federal government is more than an Active Security customer: it is also an investor. To the tune of several million dollars, the Defense Advanced Research Projects Agency (DARPA) is funding Network Associates' research on new technologies that may one day make it into the product line.

For instance, the government wants to show there's a way to automatically encrypt an entire network when a net device senses a serious security threat. "We call it 'adaptive cryptography,'" Watkins says. "DARPA is funding a lot of the research here."

Because encryption often slows network speeds due to the overhead of processing encrypted packets, managers may not want to have their links in encrypted mode all the time. But when trouble occurs, managers would want to immediately be able to scramble all data moving across the network in order to guard against intruder attack. ◪

Be a

Net Know-It-All

For the answer to this week's question and more net trivia, visit Network World Fusion and enter 2467 in the DocFinder box.

This week's question:

Why do Fibre Channel vendors spell fiber as "fibre"?

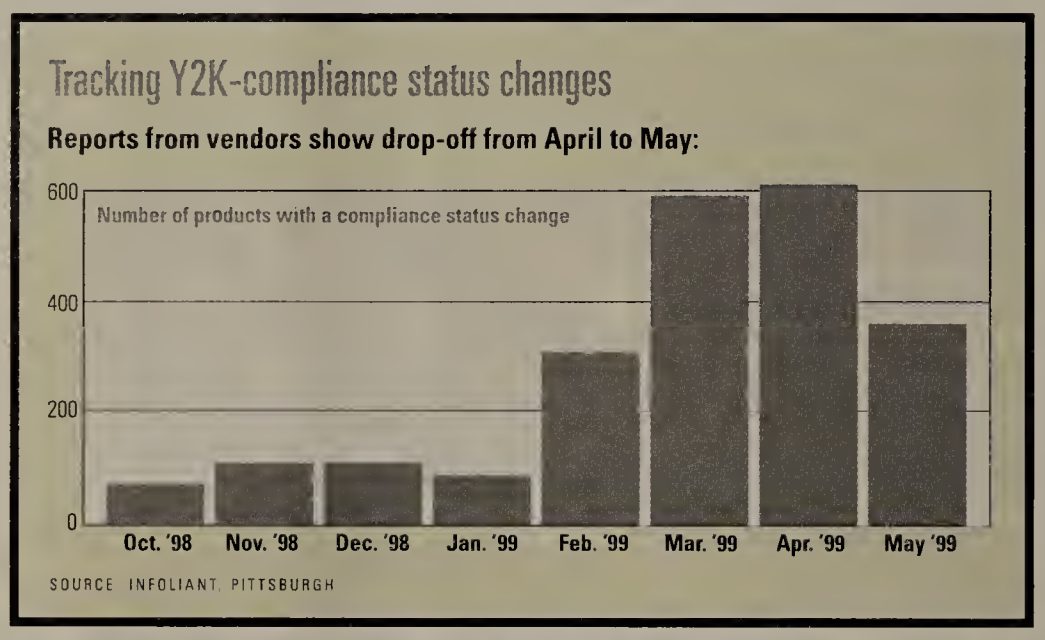
www.nwfusion.com

Vendors reporting fewer changes of Y2K status

Infoliant executive claims numbers for network products will continue to decline leading up to year-end.

BY PAUL MCNAMARA

PITTSBURGH — Vendors may finally be getting a better handle on exactly what will and will not pass Y2K muster, although Year 2000-compliance status continues to be a moving target for many network products.



Pittsburgh-based Y2K-compliance vendor Infoliant conducts a monthly Y2K status audit of its database, which contains 36,000 network and PC products from 630 vendors. Last month, the audit found 367 reported changes; for example, some products' status had changed from "compliant" to "action required" or from "pending evaluation" to "vendor will not test." That total number of changes was down from the 604 changes reported in April and the 595 changes reported in March.

"I think you're going to see the numbers continue to decline slowly," says Kevin Weaver, executive vice president at Infoliant. "I would be surprised if a monthly total hit the previous peak again this year."

Shifts in reported compliance status can leave customers' Y2K-compliance teams scrambling to patch or replace products that had previously been judged fit for the new millennium.

Weaver notes that about one-third of the changes continue to reflect bad news for customers, meaning products that once were considered compliant now have identifiable problems. Moreover, what Infoliant calls "softer changes" — a new patch for a product that was already classified "action required," for example — are not reflected in the monthly total and create yet more work for Y2K teams.

Even though time for corrective action is running short, 1,850 mostly older products in the Infoliant database are currently classified as "pending evaluation," meaning the vendors have not tested them nor have they provided any information about the products' Y2K status. ◪

Big Blue plotting grand SAN plan

Company will offer storage devices, management tools and Future I/O products.

BY MARC SONGINI

IBM plans to marry its storage-area network (SAN) lineup to the Future I/O architecture.

Future I/O is the new-generation switched fabric architecture being added to Intel-based PC servers to exploit high-speed network technologies, such as Gigabit Ethernet and Fibre Channel. It will act as an alternative to the PCI bus architecture.

Upcoming IBM SAN announcements include:

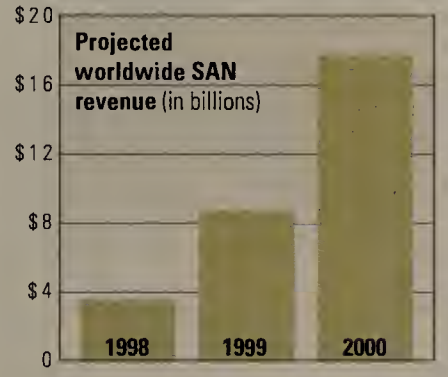
- New Fibre Channel hubs and a 16-port SAN switch.
- Tivoli SAN management tools.
- A WAN hardware gateway.

Big Blue made its first SAN announcement in February, and the company already offers a seven-port Fibre Channel 100M bit/sec hub, along with a few other storage devices. Sources say in the next six months IBM will be rolling out hubs that can be managed with Tivoli software as well as used to collect network statistics.

IBM, working with partners, is also planning to offer a Fibre Channel switch that will provide about 16 ports and be Tivoli-ready. Using the switch, any server or Fibre Channel device will be able to log on to and have dedicated links to other storage devices.

The growing SAN market

IBM wants to be on the bleeding edge with Fibre Channel and Future I/O products.



SOURCE: STRATEGIC RESEARCH, SANTA BARBARA, CALIF.

Sources also say IBM will offer a WAN bridging device for high-speed data recovery and remote disk mirroring. The device will be able to buffer data coming from a Fibre Channel SAN and run it over slower WAN lines. It will also do conversion from Fibre Channel to frame relay or ATM.

New Tivoli management capabilities are also on the way, IBM says. There will be tools that monitor SANs for bottlenecks or failure. One software component will ensure that data running between servers or storage devices in a SAN is not lost. The software can also detect if a server attached to a shared storage device is malfunctioning, and then lock the server to keep it from affecting other servers in the SAN.

IBM is also considering Future I/O for storage. Currently, PC servers, such as IBM's Netfinity and Compaq's ProLiant series, rely on a shared-bus PCI architecture that maxes out at 532M byte/sec, easily causing congestion. In contrast, Future I/O uses an internal switching fabric to route around bottlenecks so there is no single failure point. And, in its first iteration expected in a year and a half, Future I/O will run traffic at 2.5G byte/sec.

IBM views Future I/O as a natural fit for its Fibre Channel SAN strategy, says Clod Barrera, director of systems strategy at IBM's storage division.

What the Future I/O holds

In the coming years, IBM plans to offer a full line of Fibre Channel-Future I/O products, Barrera says. While the company is still reviewing the Future I/O specifications and exact product details are sketchy, IBM is working on several scenarios.

In one, users could take a group of eight-way Netfinity servers and cluster them with a high-speed SP Netfinity switch. Two or more of the servers would have special PowerPC chips that act as storage controllers and would be dedicated to running traffic to SANs.

The servers would take packets based on IP Version 6, the protocol for Future I/O, and encapsulate them inside Fibre Channel frames for connection to RAID arrays or other storage devices.

IBM is also considering using an external storage gateway that could convert IP traffic into pure Fibre Channel or SCSI for SAN connections.

Long term, IBM could use Future I/O to consolidate network and storage cables into one cable attached to a single Future I/O channel, says Tom Bradicich, a director at IBM. With Future I/O's IP Version 6 protocol support, users may also be able to run storage traffic over the Internet for virtually unlimited distances, he says.

Today, Fibre Channel products can be no further than 6.2 miles from each other. The Future I/O support would free businesses from the restraints imposed by dedicated storage networks and could ease remote data mining and other database operations. ◪

CISCO PEERS INTO FUTURE I/O

Network giant Cisco is ready to join the Future I/O movement.

The only problem is that Cisco is not sure what devices could use the advanced input/output technology. Future I/O, however, could lead Cisco to places it has never gone before, such as high-speed disk mirroring, fail-over between servers and even storage-area networks (SAN).

Cisco hasn't gotten to specific product planning, but the company will be reviewing the Future I/O specification and looking for possible avenues to explore, says company executive Frank Maly. Cisco may also become involved in disaster recovery and storage switching.

Cisco has done SNA over IP, is now working on voice over IP, and, in the future, will pursue IP over Future I/O, Maly says. Ultimately, Future I/O may mean a consolidation of a typical LAN and a SAN to create a single system-area network, running IP, he says.

As the company most commonly identified with IP routing, Cisco may have a leg up on other Future I/O supporters as the members of the Future I/O movement are endorsing IP Version 6 as the protocol of choice. After Cisco learned that IP Version 6 was going to be part of the Future I/O standard, the company decided to join the nonprofit special interest group sponsoring Future I/O.

— Marc Songini

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Notes, Domino score big with pro hockey

Twenty-eight National Hockey League rivals share data over Lotus-based network.

BY PAUL MCNAMARA

NEW YORK — Even casual fans know it's the Zamboni that makes the ice on which National Hockey League teams go at each other during the season.

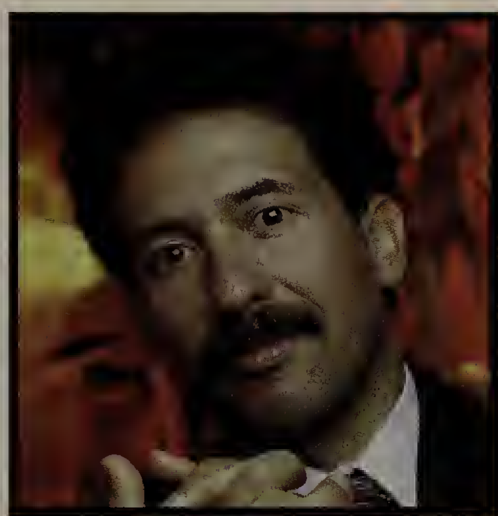
Less well known, however, is that it's a Lotus Notes- and Domino-based network that brings these 28 rivals/business partners together outside of the rink year-round.

With the NHL's Stanley Cup Playoffs racing toward a conclusion and the league's annual player draft slated for later this month, this Lotus technology is being taxed like never before, according to Peter DelGiacco, director of IT at NHL headquarters in New York.

"Without this [Notes/Domino] system set up, I wouldn't even want to think about how we would manage the business," DelGiacco says. What he is thinking about, however, is integrating the recently released Notes and Domino 5.0 into a network that links more than 1,000 NHL employees in the U.S. and Canada. The upgrade could help the league cut network connection costs and provide better mobile access for the teams, DelGiacco says.

At the core of the NHL network today is an IBM AS/400 mid-range computer, which stores all league data on player rosters, the multimillion dollar contracts fans envy, trades between teams, game statistics and shared scouting reports. DelGiacco's 15-member IT staff uses Lotus NotesPump, recently renamed Enterprise Integrator, to transfer that data from the AS/400 to a variety of different Notes applications that run on five Domino servers at the league's New York headquarters.

Each of the 28 teams and a satellite league office in Montreal has its own Domino server on-site, all of which run on IBM Netfinity 3000 PC servers. The player data is replicated on a scheduled or as-needed basis from the Domino servers in New York to the team servers over a dedicated frame relay network. Storing that data on team LANs gives end users faster access when running applications, DelGiacco says.


KENNETH GABRIELSEN

Peter DelGiacco is integrating Notes and Domino 5.0 into the National Hockey League's wide-reaching network.

The network gives teams regularly updated versions of lengthy documents such as contracts, as well as more immediate access to time-sensitive information, such as player trades. Teams also receive a variety of Notes applications to help with tasks such as team operations, marketing and public relations.

Prior to installing Notes three years ago, the league had been running AS/400 emulation over a 9.6K bit/sec dial-up connection. Today the teams have 56K bit/sec frame relay connections, while the league office has a T-1, all for less money than they had been spending on the slower network, DelGiacco says.

Notes and Domino 5.0 may cut those costs even more while giving teams much easier access to data while traveling, he says.

"We like [Version 5.0] because it brings together the Web and Lotus Notes in a much tighter way," he says. "I can build one application and make that application available via the Internet or using the Lotus Notes client."

NHL teams currently pay about $850 per month for their frame relay connections, he says. "Ultimately, what we see is eliminating the frame relay and allowing the teams to just get an Internet connection," DelGiacco says.

The NHL has already deployed a few Domino 5.0 servers at its headquarters but won't upgrade the 28 teams until these new servers have been given a more thorough workout.

"I have to be skeptical because if I believed everything everybody said about software, I'd be in a lot of trouble," DelGiacco says.

Establishing a network of this nature is not a project that can be rushed, he says.

"You've got to give yourself ample time to work out the initial bugs and kinks," he says. "When we first did the NotesPump from the AS/400, it wasn't something that would plug and play, so it took us a little bit more time than we anticipated."

In addition to facilitating the league's day-to-day operations, DelGiacco's staff will deploy a temporary Notes/Domino network for the June 26 amateur player draft at Boston's FleetCenter. A newly tweaked custom Notes application will give each of the 28 teams on-site up-to-the-minute information on who has been selected and who remains available, while allowing league officials to do on-the-fly eligibility checks on players before selections are announced.

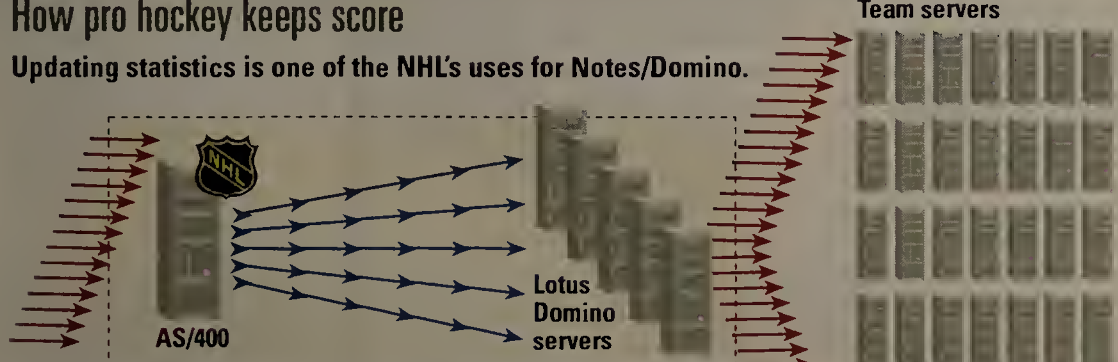
"A couple of years ago we tried [a Microsoft] Access-based type of system that kind of did the same thing, but it really wasn't networked as tightly as what we did with Lotus Notes," he says. "There was no real workflow either" with the Access system, he adds.

DelGiacco says training team representatives to use the draft-day application has proven surprisingly easy.

"These guys aren't people with strong IT backgrounds, they're hockey people who know hockey," he says. "All you have to do [to use the application] is be able to click a mouse and know who you want to pick. That's something the system won't do — it won't tell you who to pick." ◪

How pro hockey keeps score

Updating statistics is one of the NHL's uses for Notes/Domino.



❶ Official scorers at each of 14 rinks use networked laptops and a custom IBM application to record statistics. Data from games is sent over a dial-up connection to the league's AS/400 server in New York.

❷ Aggregated results are transferred from the AS/400 to five on-site Domino servers running Enterprise Integrator.

❸ Updated Notes databases are replicated overnight from Domino servers to 28 team servers over frame relay.

Compaq in disarray

A fanciful CEO takes the reins.

BY DENI CONNOR

HOUSTON — You drive past the sandy, pine woodlands of Houston, past the dingy, oil-gushing derricks on the Gulf Coast, heading to your first day as CEO of Compaq, the largest manufacturer of PCs in the world. As the successor to Eckhard Pfeiffer, you have inherited a host of problems — big ones.

You settle into a top-floor office in a building on Compaq's sprawling campus, and sit in a chair that probably used to cup the posterior of some executive who just got the boot.

First up is a meeting with Chairman Ben Rosen along with the Office of the President — and what's left of your executive staff. There will be more than a handful of chairs vacant. Over one-quarter of the management committee of Compaq has left. Look's like you'll get to eat a second croissant.

At this meeting you'll start to make the first decisions that will affect Compaq's future. It will represent your first stab at reviving a company that is gasping for life.

You told them during the interviews you could pull it off. You'd better. The previous two CEOs got tossed when the going got rough.

Under the table in the conference room you notice the panic button Pfeiffer used to summon security guards in case of trouble. You may find it handy for evicting the lawyers of angry shareholders, marshalling out departing executives or handling employees that came through acquisitions and then are jettisoned when your guys can't figure out what to do with their products.

The Upshot

We at *Network World* know full well that Compaq has been without a CEO since the ouster of Eckhard Pfeiffer earlier this year. But that didn't stop us from imagining ourselves as the new leader of Compaq, on the very first day of this very important job. While the scenes are made up, our conjecture is based upon interviews with Compaq insiders, ex-employees, customers and analysts.

One problem you're sure to mention to Rosen is this building. You've heard this high-rise edifice was commissioned by Pfeiffer, at the urging of Hans Gutsch, senior vice president of human resources. It also houses the cafeteria, executive offices, briefing center and private parking — all for the exclusive use of higher-ups.

Gutsch is a man of formidable reputation, or so you've heard — more than one employee tangled with him during his or her tenure at Compaq. Many left the firm, tired of hassling with HR over every hire or raise.

He also is reportedly responsible for locking down these executive quarters and making it difficult for people to reach you. Gutsch is from Pfeiffer's old guard and is someone you've already decided you'll have to tame — if he doesn't leave the company first. After all, nearly every one of Pfeiffer's men is gone. Mason the chief financial officer (CFO) left right after Pfeiffer, and the well-regarded John Rose, head of Compaq's Enterprise Computing Group, left last week.

The next problem is rebuilding your executive staff and getting them to move to Houston. You know systems management vendor BMC put its developers in Austin, Texas, because it couldn't get programmers to move to Houston. And even though your staff will earn enough to be able to live in the posh suburb of River Oaks, you'll still have trouble luring top talent Houston's way.

You count the departed execs and make a note to place some classified ads pronto: Rando from Services; Kurtzman from compaq.com; Heil from sales; Mason, the CFO; and several other influential and important staffers are all gone. You've even heard rumors that more executives are ready to bolt.

Then there's the stieky issue of direct sales. The company has cut its distribution channels to four partners. It's also endangered its relationships with resellers by cutting margins, going direct with Prosignias workstations and servers and other products, and failing to give resellers incentives to sell.

By its own admittance, Compaq can't do what it needs so desperately to do to revive flagging PC sales. You've seen in the firm's quarterly report where it says: "Compaq does not currently have in place processes for order entry, production of individualized units and direct distribution that can operate efficiently to manage a large portion of its current PC sales." Mark that one Top Priority.

And then there's that other little matter Eckhard left you — the integration of Tandem and Digital. These operations still seem way too separate, and their strategies aren't fully in sync with Compaq proper. Worse, customers are confused and losing confidence.

Take those OpenVMS users; they aren't happy. Somehow they don't believe Compaq will still support them and continue developing the platform. Furthermore, they don't want to move to Windows NT. They're having a user group meeting in Providence, R.I., this month, and you need to be there to shore up their confidence.

With Digital, you've acquired one of the most successful service and support organizations but haven't finished taking the message and the product line to Compaq users.

Compaq's StorageWorks, based mostly on technology from Digital, has been nicely integrated -- no problems there, but Compaq's Non-Stop eBusiness is just starting to introduce products and programs. You'll need to keep an eye on it. Compaq needs to start working on Internet time.

The story on Wall Street is a mixed bag. Analysts think Compaq deceived them with dismal financial results but that its technical expertise is without comparison. Meanwhile, shareholders have hired lawyers. You expected stockholder suits, just not this many.

As for that passel of network gear, remote access equipment and modems, if you had your druthers, you'd finish off what the firm started late last year when it disbanded its Networking and Communications Group. You don't understand why Compaq is still making network adapters in Austin when an internal study says that many of your customers want 3Com adapters in their machines. And the decision to put 120 people in Houston to work on a Fibre Channel host bus adapter is just nonsense, especially when you already OEMed one. You've got a mind to just dump those products, and the Cabletron switches too, and concentrate on core competencies.

Compaq has the servers now from top to bottom to play in markets from small businesses all the way up to the enterprise. Storage, too. But it needs a new strategy that will get the company back on financial track. You still need to figure that out, but there is no time right now. The meeting is about to begin. ◪

Compaq CEO's to do list:

- ✓ Finish integration of Tandem and Digital
- ✓ Rebuild executive staff
- ✓ Straighten out distribution channels
- ✓ Fix internal order entry, build to order systems
- ✓ Get a strategy

When will a new CEO arrive? What will he do?

No one knows. It had better be a lot.

First CEO, Rod Canion

JOHN ABBOTT

Second CEO, Eckhard Pfeiffer

Third CEO, hasn't been hired

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B699A

1. What is the principal business activity at your location? (check ONE only)

01. ☐ Manufacturing (other)
02. ☐ Finance/Banking
03. ☐ Insurance/Real Estate/Legal
04. ☐ Health Care Services
05. ☐ Hospitality/Entertainment/ Recreation
06. ☐ Media/TV/Cable /Radio/Print
07. ☐ Retail/Wholesale Trade/ Business Services
08. ☐ Transportation
09. ☐ Utilities
10. ☐ Education
11. ☐ Process Industries (Mining/Construction/Petroleum Refining/Agriculture/Forestry)
12. ☐ Government (Federal/State/Local)
13. ☐ Military
14. ☐ Aerospace
15. ☐ Consulting (Independent)*
16. ☐ Carriers/Interconnects
17. ☐ Internet Service Provider (ISP)
18. ☐ Manufacturing (Computer/ Communications/DEM)
19. ☐ Resellers of Computer/Network Products (VARs, VADs)
20. ☐ Systems/Network Integrators*
21. ☐ Distributors (Computer/ Communications)*
22. ☐ Other (please specify) _____

** Please complete form based on largest client.*

2. What is your job function? (check ONE only)

NETWORK IS MANAGEMENT:

1. ☐ Network Management
2. ☐ LAN Management
3. ☐ Datacom/Telecom Management
4. ☐ IS/IT/MIS/CID/Systems Management
5. ☐ Internet/Intranet/Electronic Commerce Mgmt., Webmaster
6. ☐ Engineering Management
7. ☐ Corporate Management (CEO, Pres., VP, Dir., Mgr., Financial Management)
B. ☐ Consultant (Independent)
9. ☐ Other _____

3. What is the estimated value of Network equipment and services that you specify, recommend or approve the purchase of? (Please print the appropriate number code on the line next to each product category. Please complete ALL categories A–N.)

1. $100 Million or more
2. $50 Million to $99.9 Million
3. $25 Million to $49.9 Million
4. $10 to $24.9 Million
5. $1 to $9.9 Million
6. $100,000 to $999,999
7. $50,000 to $99,999
8. Under $50,000
9. None of the above

A _____ Large Systems (Mainframes/Minis)
B _____ Desktops (Micros/Laptops/Workstations)
C _____ Servers
D _____ LANs
E _____ WAN Equipment
F _____ Carrier Services
G _____ Internetworking
H _____ Internet
I _____ Intranet
J _____ Extranet
K _____ Remote Access
L _____ Peripherals
M _____ Software
N _____ Service/Support

4. What is the total number of sites for which you have purchase influence? (check ONE only)

1. ☐ 100+ 2. ☐ 50 – 99 3. ☐ 20 – 49 4. ☐ 10 – 19 5. ☐ 2 – 9 6. ☐ 1 7. ☐ None

5. What is the total number of Servers/Clients/LANs installed/planned at your location/ in your entire organization? (check ONE box in each column)

SERVERS		CLIENTS		LANS	
At Location A	Entire Org. B	At Location C	Entire Org. D	At Location E	Entire Org. F
☐ 1. 50,000+	☐	☐ 1. 50,000+	☐	☐ 1. 50,000+	☐
☐ 2. 10,000 to 49,999	☐	☐ 2. 10,000 to 49,999	☐	☐ 2. 10,000 to 49,999	☐
☐ 3. 1,000 to 9,999	☐	☐ 3. 1,000 to 9,999	☐	☐ 3. 1,000 to 9,999	☐
☐ 4. 100 to 999	☐	☐ 4. 100 to 999	☐	☐ 4. 100 to 999	☐
☐ 5. 50 to 99	☐	☐ 5. 50 to 99	☐	☐ 5. 50 to 99	☐
☐ 6. 10 to 49	☐	☐ 6. 10 to 49	☐	☐ 6. 10 to 49	☐
☐ 7. 1 to 9	☐	☐ 7. 1 to 9	☐	☐ 7. 1 to 9	☐
☐ B. none	☐	☐ B. none	☐	☐ 8. none	☐

6. What is your scope and involvement in purchasing decisions for network products and services for your enterprise?

A. Scope (check one only)
1. ☐ Corporate/Enterprise
2. ☐ Department
3. ☐ None

B. Involvement (check ALL that apply)
1. ☐ Create Network Strategy
2. ☐ Recommend/Specify
3. ☐ Approve
4. ☐ Evaluate
5. ☐ Determine the Need
6. ☐ None

7. What is the estimated number of employees at your location/in entire organization? (check ONE in each section)

A. At your location:
1. ☐ Over 20,000
2. ☐ 10,000 – 19,999
3. ☐ 5,000 – 9,999
4. ☐ 2,500 – 4,999
5. ☐ 1,000 – 2,499
6. ☐ 500 – 999
7. ☐ 250 – 499
B. ☐ 249 or less

B. Entire organization:
1. ☐ Over 20,000
2. ☐ 10,000 – 19,999
3. ☐ 5,000 – 9,999
4. ☐ 2,500 – 4,999
5. ☐ 1,000 – 2,499
6. ☐ 500 – 999
7. ☐ 499 or less

8. Please indicate the products/services that you are currently involved in purchasing or plan to purchase: (check ALL that apply)

A. Currently involved in purchasing B. Plan to purchase

INTERNET/INTRANET

A	B		A	B		A	B	
☐	☐	01. Internet Services/Web Hosting	☐	☐	07. Voice/Video Over IP	☐	☐	12. Web Browsers
☐	☐	02. Firewalls/Security/Encryption	☐	☐	08. VPN Equipment/Services	☐	☐	13. Intranet Applications/Groupware
☐	☐	03. Web Servers/Software	☐	☐	09. Legacy Integration Tools (Web to Host)	☐	☐	14. Search/Retrieval Products (web crawler)
☐	☐	04. Web Servers/Hardware	☐	☐	10. Web Development Tools (JAVA, ActiveX, etc.)	☐	☐	15. Electronic Commerce Tools
☐	☐	05. TCP/IP Software				☐	☐	16. Web Authoring Tools
☐	☐	06. Management/Monitoring Software	☐	☐	11. Push Technology	☐	☐	17. Other _____

LOCAL-AREA NETWORKS/ INTERNETWORKING

A	B		A	B		A	B	
☐	☐	18. Local-Area Networks	☐	☐	28. Layer 3 Switches	☐	☐	37. UPS
☐	☐	19. Network Operating System Software	☐	☐	29. Network Storage Devices (NASs, SANs)	☐	☐	38. Network Interface Cards (NICs)
☐	☐	20. Servers	☐	☐	30. LAN Storage/Backup	☐	☐	39. Hubs
☐	☐	21. Print Servers	☐	☐	31. Optical Storage/Backup/ Jukeboxes	☐	☐	40. Intelligent Hubs
☐	☐	22. Routers				☐	☐	41. Stackable Hubs
☐	☐	23. ATM Switches	☐	☐	32. Disk Storage/Backup	☐	☐	42. Bridge/Router
☐	☐	24. Token-Ring Switches	☐	☐	33. Tape Storage/Backup	☐	☐	43. SNMP Network Management
☐	☐	25. Ethernet Switches	☐	☐	34. RAID Storage/Backup	☐	☐	44. Gateways
☐	☐	26. Fast Ethernet	☐	☐	35. Network Test/Diagnostic Tools	☐	☐	45. Concentrators/Repeaters
☐	☐	27. Gigabit Ethernet	☐	☐	36. Cables, Connectors, Baluns	☐	☐	46. Other (please specify) _____

COMPUTERS/PERIPHERALS

A	B		A	B		A	B	
☐	☐	47. Thin Clients/Network Computers (NCs)	☐	☐	50. Minis	☐	☐	54. CD-RDM/DVD
☐	☐	48. Laptops/Notebooks/Sub-Notebooks	☐	☐	51. Mainframes	☐	☐	55. Fax/Modem Boards
☐	☐	49. Micros/PCs	☐	☐	52. Workstations	☐	☐	56. Memory/Chips/Boards/Cards
			☐	☐	53. Printers/Network Printers	☐	☐	57. Other _____

REMOTE/WIRELESS COMPUTING

A	B		A	B		A	B	
☐	☐	58. Remote Access Products	☐	☐	61. PCMCIA Devices	☐	☐	63. Cellular Equipment & Services
☐	☐	59. Remote Access Services	☐	☐	62. Wireless Data Equipment/Services	☐	☐	64. Other (please specify) _____
☐	☐	60. PDAs						

SOFTWARE/APPLICATIONS

A	B		A	B		A	B	
☐	☐	65. Network Management	☐	☐	75. EDI	☐	☐	B4. Data Warehousing
☐	☐	66. Systems Management	☐	☐	76. E-mail	☐	☐	B5. Anti Virus Software
☐	☐	67. Security	☐	☐	77. Desktop Videoconferencing	☐	☐	B6. Multimedia
☐	☐	68. Communications Software	☐	☐	78. Imaging	☐	☐	B7. Yr. 2000 Conversion Software (Y2K)
☐	☐	69. Terminal Emulation	☐	☐	79. Suites/Server Suites (Back Office, etc.)	☐	☐	B8. Helpdesk
☐	☐	70. Operating Systems				☐	☐	89. Web Based Management Tools
☐	☐	71. Applications Development Tools	☐	☐	80. Middleware	☐	☐	90. Directory Services
☐	☐	72. Database Management/ RDBMS	☐	☐	81. Document Management	☐	☐	91. Other (please specify) _____
☐	☐	73. Groupware	☐	☐	82. Site Metering Tools			
☐	☐	74. Workflow	☐	☐	83. Computer Telephony Integration (CTI)			

WIDE-AREA NETWORK EQUIPMENT & SERVICES

A	B		A	B		A	B	
☐	☐	92. 56 Kbps Modems	☐	☐	99. xDSL Services/Products	☐	☐	10B. Managed LAN/Router Services
☐	☐	93. Under 56 Kbps Modems	☐	☐	100. Diagnostic/Test Equipment	☐	☐	109. Other _____
☐	☐	94. Cable Modems	☐	☐	101. DSU/CSU			
☐	☐	95. Asynchronous Transfer Mode (ATM)	☐	☐	102. PBXs	☐	☐	110. Outsourcing/Systems Integration Services
☐	☐	96. Frame Relay Equipment/ Services	☐	☐	103. Videoconferencing	☐	☐	111. Education/Training Services
☐	☐	97. ISDN Equipment & Services	☐	☐	104. Leased Lines			
☐	☐	98. FT-1/T-1/T-3 Multiplexers/Services	☐	☐	105. Switched Data			
			☐	☐	106. Virtual Private Networks (VPN)	☐	☐	112. None of the above (1–111)
			☐	☐	107. FRADs			

9. Please indicate the platforms that are currently installed/planned: (check ALL that apply)

A. Currently installed B. Planned for purchase

NETWORK PROTOCOLS

A	B		A	B		A	B	
☐	☐	01. TCP/IP	☐	☐	04. Novell IPX/SPX	☐	☐	07. NFS
☐	☐	02. IPv6	☐	☐	05. APPC/APPN/LU 6.2	☐	☐	08. SNMP
☐	☐	03. SNA	☐	☐	06. NETBIOS	☐	☐	09. Other _____

LAN ENVIRONMENT

A	B		A	B		A	B	
☐	☐	10. Gigabit Ethernet	☐	☐	14. ATM	☐	☐	18. FDDI
☐	☐	11. Switched Ethernet	☐	☐	15. Token Ring/Token Ring Switching	☐	☐	19. 100Base-T
☐	☐	12. Fast Ethernet (100 Megabit Ethernet)	☐	☐	16. IP Switching	☐	☐	20. 10Base-T
☐	☐	13. Ethernet	☐	☐	17. Layer 3 Switching	☐	☐	21. Fibre Channel
						☐	☐	22. Other _____

NETWORK OPERATING SYSTEM

A	B		A	B		A	B	
☐	☐	23. Windows NT	☐	☐	27. Novell (NetWare 4.X)	☐	☐	31. IBM (Server)
☐	☐	24. Windows NT/Advanced Server	☐	☐	28. Novell (NetWare 2.X, 3.X)	☐	☐	32. Other (please specify) _____
☐	☐	25. Novell IntranetWare	☐	☐	29. Microsoft (LAN Manager)			
☐	☐	26. Novell (NetWare 5.X)	☐	☐	30. Banyan (VINES)			

COMPUTER OPERATING SYSTEM

A	B		A	B		A	B	
☐	☐	33. NT Server	☐	☐	38. Windows 95	☐	☐	43. Digital VMS
☐	☐	34. NT Workstation	☐	☐	39. Windows 98, .9x	☐	☐	44. Macintosh
☐	☐	35. Unix/Xenix/AIX/SCO	☐	☐	40. DDS	☐	☐	45. Other _____
☐	☐	36. Solaris	☐	☐	41. DS/2, DS/2 Warp	☐	☐	46. None of the above (1–45)
☐	☐	37. Windows	☐	☐	42. IBM MVS/VM/VSE			

10. Which of the following Servers/Clients do you have installed/planned at your location? (check ALL that apply in each column)

	A. Servers	B. Clients		A. Servers	B. Clients
Power PC	☐ 01.	☐	4B6, 386, 286	☐ 07.	☐
Power Mac	☐ 02.	☐	Sun Sparc	☐ 08.	☐
Mac Other	☐ 03.	☐	Risc	☐ 09.	☐
Multiprocessor Servers	☐ 04.	☐	Alpha	☐ 10.	☐
Pentium II (PII)	☐ 05.	☐	Other	☐ 11.	☐
Pentium/Pentium Pro	☐ 06.	☐			

11. Which of the following hardware platforms are installed/planned in your company? (check ALL that apply)

A - Mainframes (Large Scale)
1. ☐ IBM
2. ☐ Amdahl
3. ☐ Cray
4. ☐ Hitachi
5. ☐ Unisys
6. ☐ Other _____

B - Minis (Midrange)
1. ☐ IBM RS/6000
2. ☐ IBM AS/400
3. ☐ Digital
4. ☐ Tandem
5. ☐ Unisys
6. ☐ AT&T GIS
7. ☐ H-P
8. ☐ Data General
9. ☐ Other _____

C - Workstations
1. ☐ Sun Microsystems
2. ☐ Silicon Graphics
3. ☐ Digital
4. ☐ H-P
5. ☐ IBM
6. ☐ Other _____

12. What is the estimated gross revenue of your entire company/institution? (check ONE only)

01. ☐ $20 billion or more
02. ☐ $10 billion to $19.9 billion
03. ☐ $1 billion to $9.9 billion
04. ☐ $500 million to $999.9 million
05. ☐ $100 million to $499.9 million
06. ☐ $50 million to $99.9 million
07. ☐ $10 million to $49.9 million
08. ☐ $5 million to $9.9 million
09. ☐ $4.9 million or less
10. ☐ None of the above

13. For which areas outside of North America do you have purchase influence? (check ALL that apply)

1. ☐ Europe 2. ☐ Asia 3. ☐ South America 4. ☐ Australia 5. ☐ Middle East 6. ☐ None

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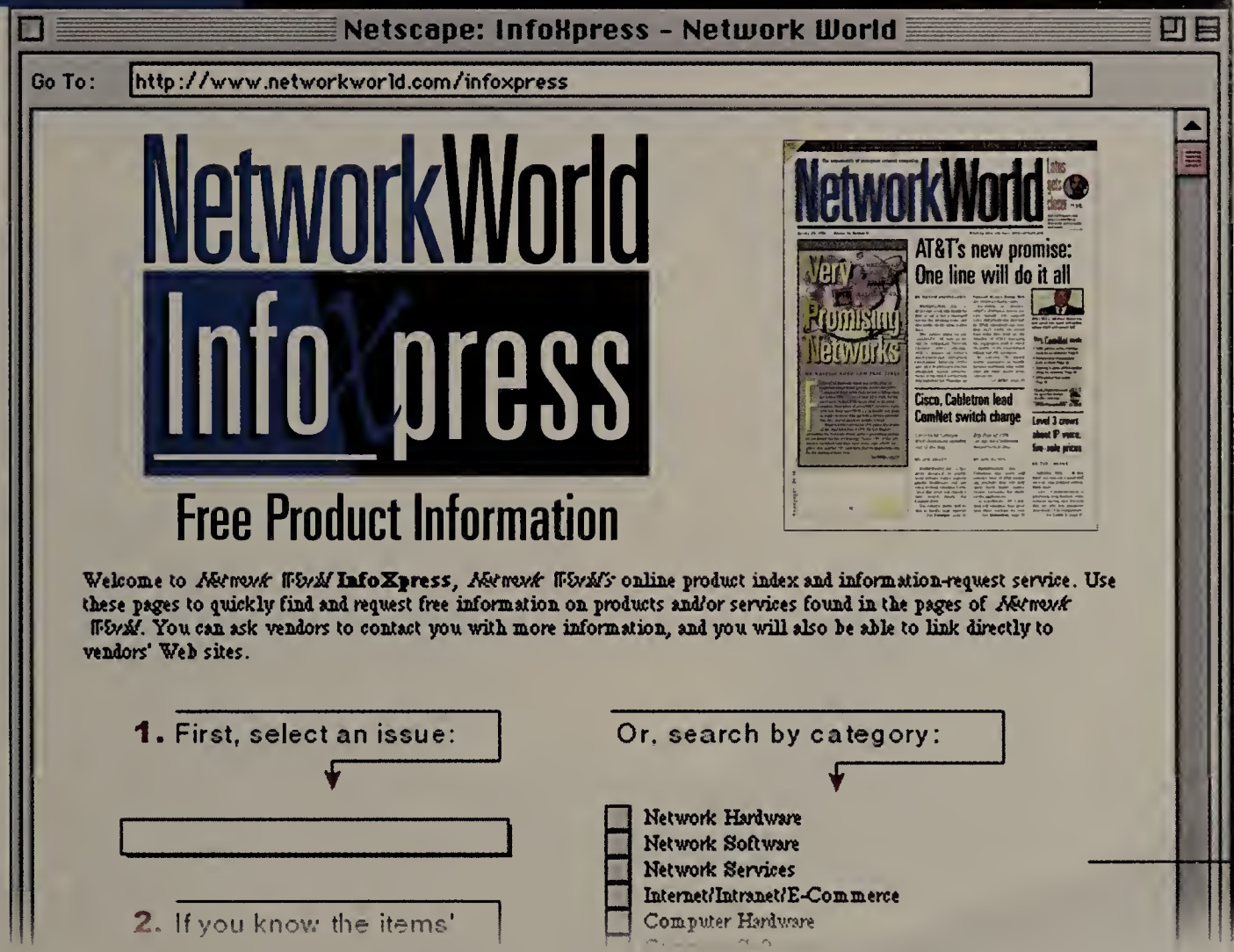

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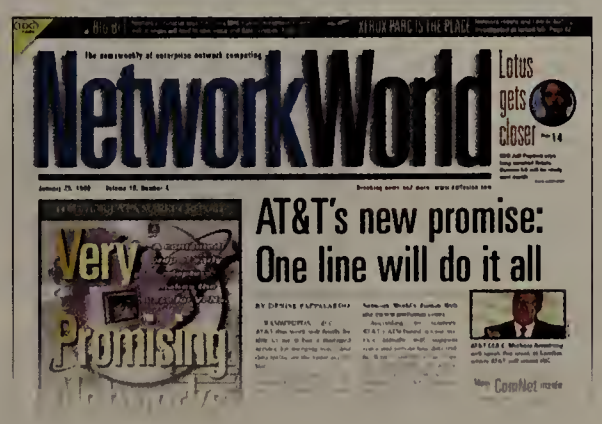

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Briefs

IMC Networks has unveiled an Ethernet switch that supports copper and fiber media, with prices starting at $900.

The AnyWay Switch/3 sports 12 10/100M bit/sec ports. It features a three-slot chassis that can house a combination of four-port 10/100 autosensing copper modules and four-port 100M bit/sec fiber boards.

The AnyWay Switch/3 chassis costs $600. Modules are priced from $300 for a 10/100 twisted-pair copper board to $1,120 for a 100M bit/sec fiber card.

The switch is available now.

IMC: (800) 624-1070

Microsoft last week announced that Chief Technology Officer Nathan Myhrvold will be taking a one-year leave of absence. A written statement from Microsoft, stressing 39-year-old Myhrvold's history and importance to the company, had the tone of a farewell. Rick Raschid will be in charge of basic research activities in Myhrvold's absence.

Microsoft's Myhrvold takes a break.

Myhrvold will use the year to pursue scientific interests, according to the Microsoft statement. This summer he will join an expedition hunting for dinosaur remains in eastern Montana.

Myhrvold, who joined Microsoft in 1986, is known as the person who spearheaded the company's efforts to build a serious research lab. He founded Microsoft Research in 1991. Today the lab has on its payroll nearly 400 researchers.

"I would not be surprised if Myhrvold chose not to return," says Dwight Davis, an analyst at market research firm Summit Strategies.

IN-SITE: *Lessons from Leading Users*

Real estate firm is sold on VPN technology

BY TIM GREENE

As a real estate company, Old Republic Title knows a thing or two about moving. But IS Manager Robert Matanane acknowledges that the company's move from a dial-up modem-based network to a virtual private network (VPN) has had its share of surprises.

For example, the firm has had to rely on more site visits from its hardware suppliers than anticipated. And some of Old Republic's assumptions about ease of use for end users have proven to be overly optimistic.

But overall, Matanane says the VPN is a vast improvement over the company's dial-up WAN in terms of speed, security and flexibility. And the company, which uses its network to exchange documents and other data, has already used the VPN to close transactions in the U.S. and abroad.

Before the VPN, Old Republic offices in Arizona, California, Hawaii, Nevada and Washington about once per hour dialed out to a hub site in their respective states to dump accounting data from real estate transactions. Those hub sites would then dial the Santa Clara, Calif., office to transfer the data to a Windows NT server.

But this network proved difficult to maintain and keep secure.

"I don't want modems on the network for security reasons," Matanane says. "I want to be able to authenticate and shore up one pipe rather than have to deal with many different holes in the network."

Old Republic decided to link the

See **VPN**, page 20

CINDY CHARLES

Old Republic's Robert Matanane gladly ditched his dial-up WAN.

IBM morphs OS/2 Warp Server into e-business platform

First release of operating system in two years comes with an electronic commerce spin.

BY JOHN FONTANA

IBM has reduced its OS/2 Warp Server line to a single product in an effort to position the platform for e-business and network computing applications.

The company quietly slipped its new OS/2 Warp Server for e-business out the door late last month. This is the first full upgrade to the product since fall of 1996.

The new version groups all the features of the previous editions of the server — Entry, Advanced and SMP — into a single product. The company has also added the ability to manage NT servers from OS/2 domains, a series of file system options and a new volume manager.

"This new server is a sort of middleware running applications, databases and Web services between a Windows or OS/2 client and an OS/390 on the back end," says Bill Peterson, an analyst with International Data Corp in Framingham, Mass.

The repositioning of the server, however, isn't expected to help OS/2's slipping share of the server operating system market. IDC reports that OS/2 represents 6% of units shipped, whereas NT has a 38% share and NetWare has a 28% share.

"We are not positioning OS/2 for a fight with NT or other operating systems," says Ken Christopher, project executive for OS/2 Warp Server for e-business. "We are giving our customers e-business and network tools to protect their investment as they transition from legacy systems and applications."

IBM has added a Journaled File System, much like that found in IBM's AIX platform, to handle applications that need high-performance file access on the server. Those applications include Lotus Notes and DB2, which can be used to support electronic commerce. The new file system supports two terabytes of storage. IBM has also added support for Network File System for Unix connectivity and continues to support the 386 High Performance File System.

The new Logical Volume Management feature lets volumes of disk storage be expanded across multiple drives and supports granular partitioning of resources.

Warp for e-business also supports symmetric multiprocessing or uniprocessing deployments. It is Year 2000-compliant and can handle transactions using the new Euro currency.

The server ships with IBM's Websphere Application and Web Servers, and with NetFinity Manager. It also supports integration with Tivoli Enterprise Management.

The server is priced at $1,700 and is available now.

IBM: (800) 772-2227

3Com delivers on QoS promises

Company aims to improve service quality across mixed Ethernet and ATM networks.

BY JIM DUFFY

MARLBOROUGH, MASS. — 3Com last week made good on its pledge to map Ethernet-to-ATM quality of service (QoS) by unveiling new modules for its SuperStack II and CoreBuilder LAN switches.

The modules sport new Application Specific Integrated Circuits (ASIC) — called ZipChip 3 and FIRE — that will let users enforce policies for ensuring consistent QoS in mixed Ethernet and ATM networks. The modules were expected (*NW,* April 12, page 1).

3Com's Ethernet-to-ATM QoS mapping strategy is intended to deliver consistent QoS across different network media, which is vital to voice, data and video convergence. If QoS fluctuates among different media types, the result is poor service that negates the other chief benefits of convergence: reduced equipment and service costs.

3Com rivals FORE Systems and Cisco claim that they too can provide Ethernet-to-ATM QoS mapping, though their implementations may differ from 3Com's.

3Com's ZipChip 3 modules include an OC-3/OC-12 blade for 3Com's SuperStack II 1100 and 3300 switches, and a 10/100M bit/sec Ethernet card for the company's CoreBuilder 7000HD switch.

The OC-3/ OC-12 module features a single ATM port that is software configurable to operate at either 155M or 622M bit/sec. The module is intended to provide a single uplink from a stack of SuperStack IIs to a 3Com CoreBuilder 9000 ATM backbone switch. Also, multiple uplinks can be installed in a stack for redundancy.

3Com customer Mid America Energy in Des Moines, Iowa, likes the redundancy feature but is a bit baffled with the module's $6,000 price.

"For some customers that pricing is going to be a little steep," says Paul Hutson, senior network analyst at Mid America. "If all they're looking for is an OC-3 connection, they're basically paying for an OC-12."

The 10/100 Ethernet card, dubbed the 7900, sports 36 10/100 copper ports with RJ-45 connectors. It is designed to connect desktops to ATM building, campus and metropolitan-area backbone networks anchored by the CoreBuilder 9000.

The FIRE ASIC-based modules are OC-3 and OC-12 ATM cards for 3Com's CoreBuilder 3500 Layer 3 switch. The modules support either two OC-3 ports or one OC-12 interface. They are designed to route traffic between ATM emulated LANs with or without the Multiprotocol-over-ATM standard.

Missing from 3Com's Ethernet-to-ATM QoS mapping program are ZipChip 3-based Ethernet modules for the CoreBuilder 9000. This would let users connect to the ATM backbone using Ethernet uplinks instead of ATM. 3Com officials say these modules will emerge early next year.

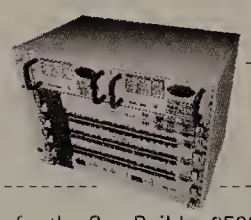
The ZipChip 3 module for the SuperStack II 1100 and 3300 switches costs $6,000 and will be available in July. The 7900 module costs $15,000 and will be available in the fourth quarter. The FIRE modules for the CoreBuilder 3500 cost $10,000 for OC-3 and $12,000 for OC-12. They will be available in August.

3Com: (508) 323-5000

Mapping with modules

3Com's new switch modules enable Ethernet-to-ATM QoS mapping.

OC-3/OC-12 ATM modules for the SuperStack II Switch 1100/3300
- Shipping in July
- $6,000



7900 10/100 Ethernet modules for the CoreBuilder 7000HD
- Shipping in fourth quarter
- $15,000

OC-3/OC-12 ATM Layer 3 interfaces for the CoreBuilder 3500
- Shipping in August
- $10,000 to $12,000

VPN,
continued from page 19

regional hubs to the Santa Clara site via a VPN comprising secure links over the Internet. The company also upgraded connections into the state hubs from dial-up to 128K bit/sec frame relay.

The Internet acts as the VPN's backbone and costs less than half as much as the alternative Matanane considered — interstate T-1 frame relay.

To prepare for the frame relay circuits that feed into the hub sites, Old Republic replaced NT remote access servers at the five state hub sites with 3Com Netbuilder II routers.

Matanane then installed a 3Com Pathbuilder 500 VPN tunnel switch in Santa Clara to terminate the Internet connections from the hub sites.

Those sessions are secured using encryption and packet encapsulation via point-to-point tunneling protocol (PPTP). Similar secure tunnels are used by about 40 Old Republic employees who want to access the corporate network from home.

Before buying the tunnel switch, Old Republic considered VPN gear from Cisco and Cabletron, but opted to go with 3Com because the firm's IS staff was familiar with 3Com gear.

Matanane says the documentation for the tunnel switch was a little thin, so Old Republic has relied heavily on 3Com technicians to set up the VPN. "It definitely helps to have someone who has actually done this before," he says.

While the VPN has provided benefits for the company, Matanane acknowledges that some of his expectations for the VPN were unrealistic.

For instance, he thought that when a user logged on to the tunnel server, that user authentication could be extended to corporate LANs. But it turns out that the remote user must utilize a separate user name and password to reach a corporate LAN.

Another surprise was that if, for some reason, the tunnel switch goes down and needs to be rebooted, a network manager also has to reboot the routers at the hub sites before they can re-establish links to the switch.

However, with an uninterruptible power supply backing up the switch, Matanane expects this will not be a big problem.

In addition to connecting the hub sites to headquarters, the VPN supports e-mail for 1,700 Old Republic workers who never had it before.

An added benefit of the new network is the possibility of using surplus capacity on the frame relay links to carry voice traffic within states.

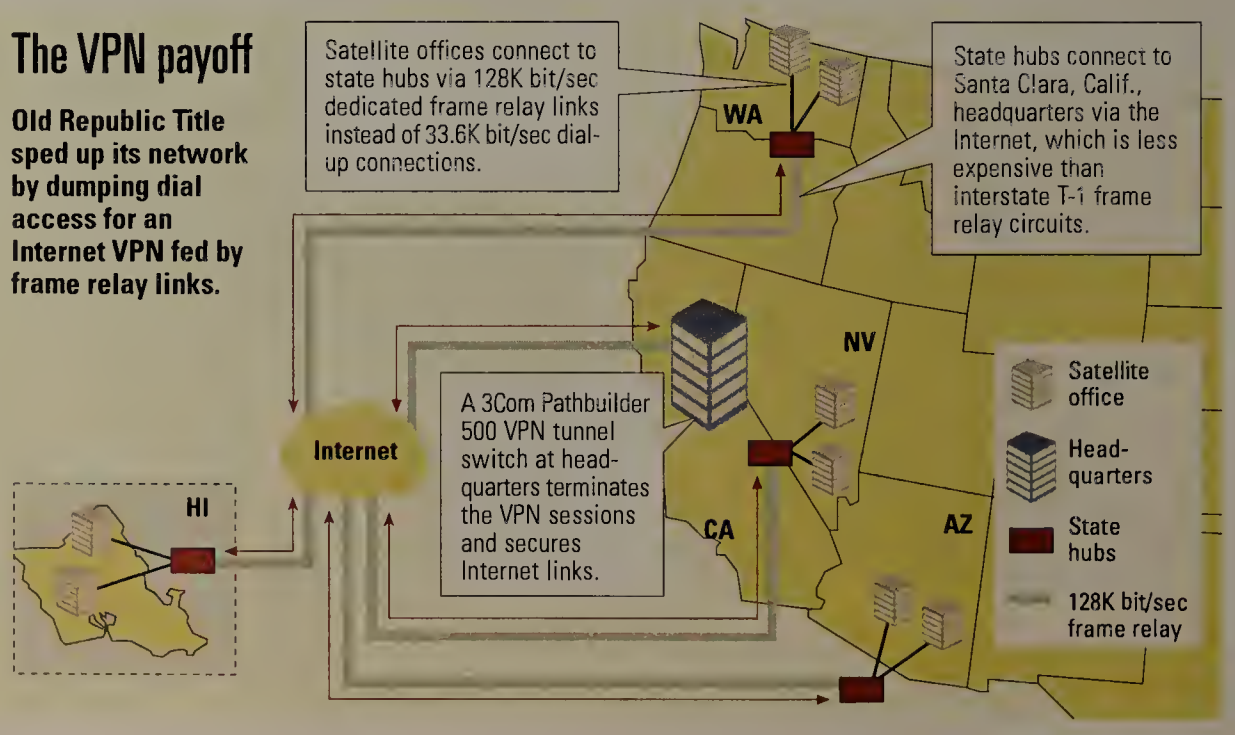
The lines from satellite offices to the hub sites run at only 128K bit/sec today but could handle up to 1.5M bit/sec.

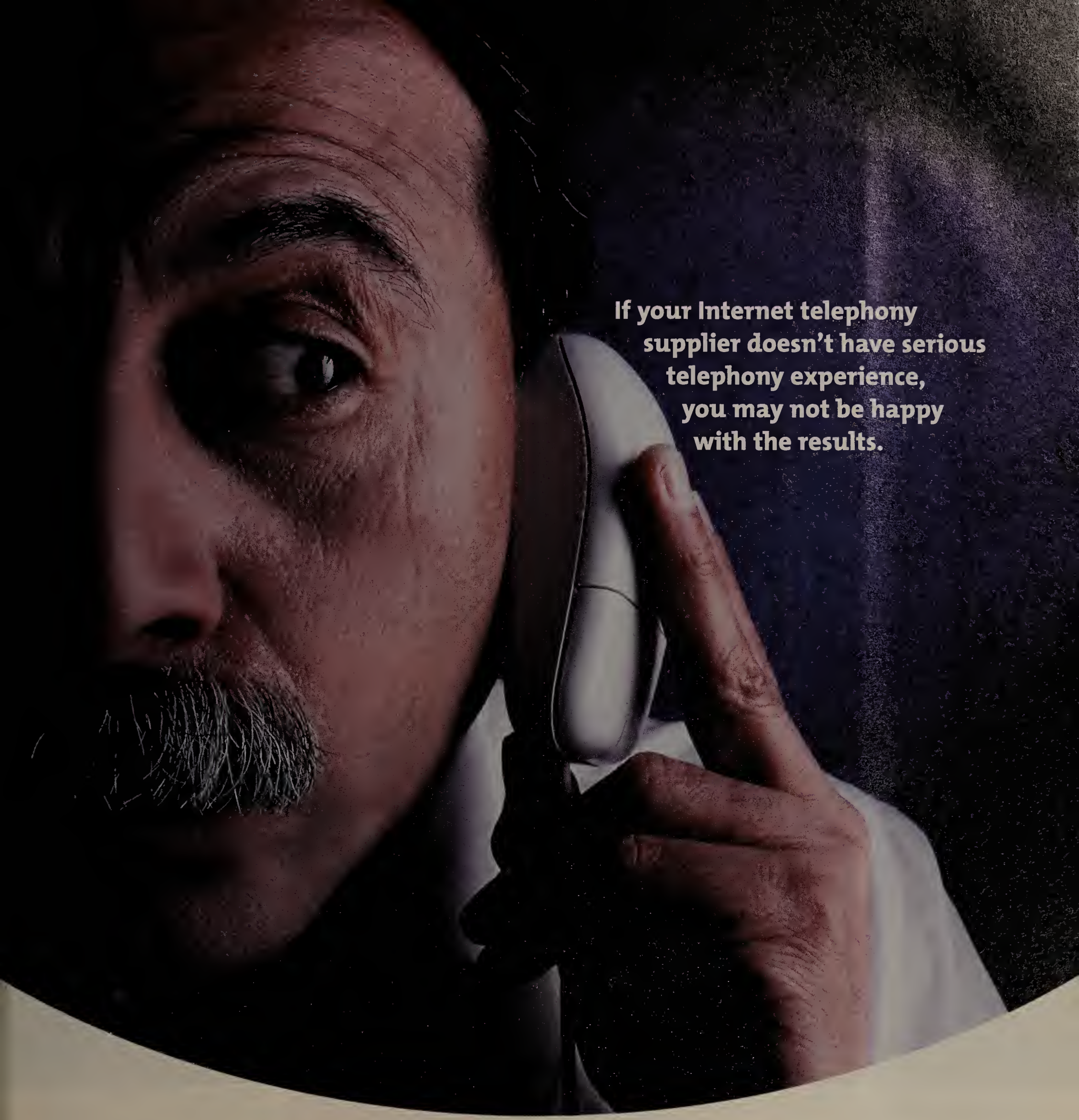
Old Republic is also considering access methods for home users that are faster than dial-up. These might include digital subscriber line technology and cable modems.

For now, the Internet offers fast enough service across the VPN backbone, Matanane says. He figures the Internet will mature and get faster to support Old Republic's network demands as they increase. ◪

The VPN payoff

Old Republic Title sped up its network by dumping dial access for an Internet VPN fed by frame relay links.





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IBM making noise in voice-over-IP market

BY MARC SONGINI

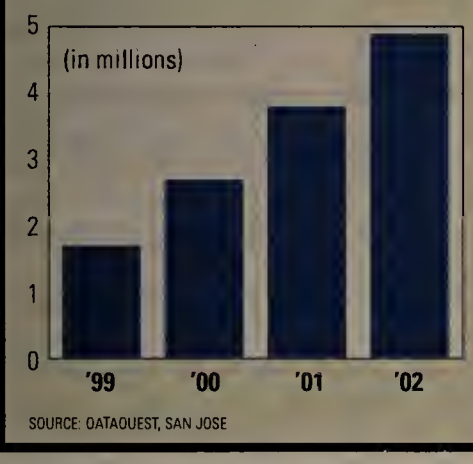
RESEARCH TRIANGLE PARK, N.C. — IBM's Networking Hardware Division apparently doesn't believe that integrating SNA and IP is enough — the group is also looking to help customers run voice over their IP networks.

The company plans to attack the voice-over-data market by adding support for voice traffic to its existing access devices, routers and other gear, IBM officials say.The support will come in the form of new adapter cards and common code upgrades to be delivered over the next 12 months.

Converging voice and data traffic onto the same network can save customers money and simplify net management, proponents say.

IP callers on the rise

The expected explosion in IP telephony has not escaped the likes of IBM.



SOURCE: DATAQUEST, SAN JOSE

IBM officials expect the market for voice-over-data products to be worth as much as $2 billion over the next three years, and the company wants a piece of the action.

The company has obtained H.323-based voice-over-IP technology through its acquisition of Databeam. The technology will be implemented into the software running on IBM's 2216 SNA/IP routing devices, 2212 access products, 2210 IP routers and other products.

Under an agreement with Nuera Communications, IBM has also acquired technology needed to deliver voice-over-data modules for its various network devices. The modules will be available later this month and can be used for running voice over frame relay. Later this year, IBM will use the same modules for voice-over-IP traffic.

IBM's voice-over-data products will largely be aimed at enterprises looking to run voice over data networks extending to remote offices, says Ron Suciu, a marketing manager at IBM.

The company also plans to integrate any new voice-over-data technologies with existing IBM policy and bandwidth management technologies. Such management technologies can be used to give voice traffic priority over less delay-sensitive traffic.

IBM is not eyeing the market for big convergence devices designed to run in carrier networks.

However, the company plans to provide voice/data boxes to service providers under OEM agreements. The providers will then install the boxes at customer sites as part of managed service offerings. ◩

NetWare 5 clustering strategy taking form

Server failover product ships; other products on the way.

BY ROBIN SCHREIER HOHMAN

PROVO, UTAH — Novell Standby Server is now shipping for NetWare 5, but those who use most other Novell clustering services are going to have to wait a while longer before upgrading their networks to the most recent version of NetWare.

Standby Server for NetWare 5, which began shipping last week, is used to create a fully replicated backup for a single server.

Meanwhile, Novell Cluster Services, which is used to cluster up to 32 servers for fault tolerance, is in beta testing and won't ship until August.

Another clustering product, Novell High Availability Server, will not be upgraded for NetWare 5 networks. This product enables two active servers to back up each other.

Novell High Availability Server users will be encouraged to switch to Novell Cluster Services, says Rajeev Danank, a Novell product marketing manager. Otherwise, users can upgrade the rest of their networks to NetWare 5 and continue to run Novell High Availability Server on NetWare 4.1. The company will release Novell High Availability Server for NetWare 4.2 later this month.

Novell Standby Server Many-to-One, which connects one primary server to multiple backup servers, is now shipping for NetWare 3.X and 4.X and is scheduled to ship for NetWare 5 in August.

Novell's System Fault Tolerance III (SFT III) is now available for NetWare 4.11 and 4.2, but the product won't be upgraded to run on NetWare 5. Many, but not all, of the features of SFT III will be available in the first release of Novell Cluster Services. Support for gray data — data that's in memory but hasn't been written to disk yet — will have to wait until a future release of Novell Cluster Services, Danank says.

Novell Replication Services, which lets companies replicate servers across several locations, is now shipping for NetWare 5.

SnapShot Server is also shipping for NetWare 5. This software runs atop Standby Server and mirrors a data set on a passive computer. SnapShot Server uses NetWare's mirroring feature and replicates a data set every time there is a write request at the primary server.

Novell Standby Server for NetWare 5 costs $4,285 and also supports Versions 3.12, 3.2, 4.11 and 4.2. The only difference between buying Standby Server from Novell and buying it from Vinca, the original manufacturer, is the pricing. Large Novell customers may get a better discount if they buy from Novell.

Novell: (800) 453-1267

Keeping NetWare up and running

Novell Standby Server is the first high-availability product to ship for NetWare 5. Some products, such as Novell High Availability Server, will not be upgraded for NetWare 5.

Product	Description	Price	Runs on NetWare 5?
Novell Standby Server	Lets one server back up another	$4,285	Yes
Novell Standby Server Many-to-One	Allows one passive standby server to back up multiple primary servers	$6,000	Yes, will ship in August
Novell Cluster Services	Supports up to 32 servers in a cluster	Not yet available	Yes, when it ships later this year
Novell High Availability Server	Provides failover between two active nodes in a cluster	$3,895	No
System Fault Tolerance III	Provides hardware fault tolerance	$1,500	No
Novell Replication Services	Replicates servers across several locations	$1,000	Yes

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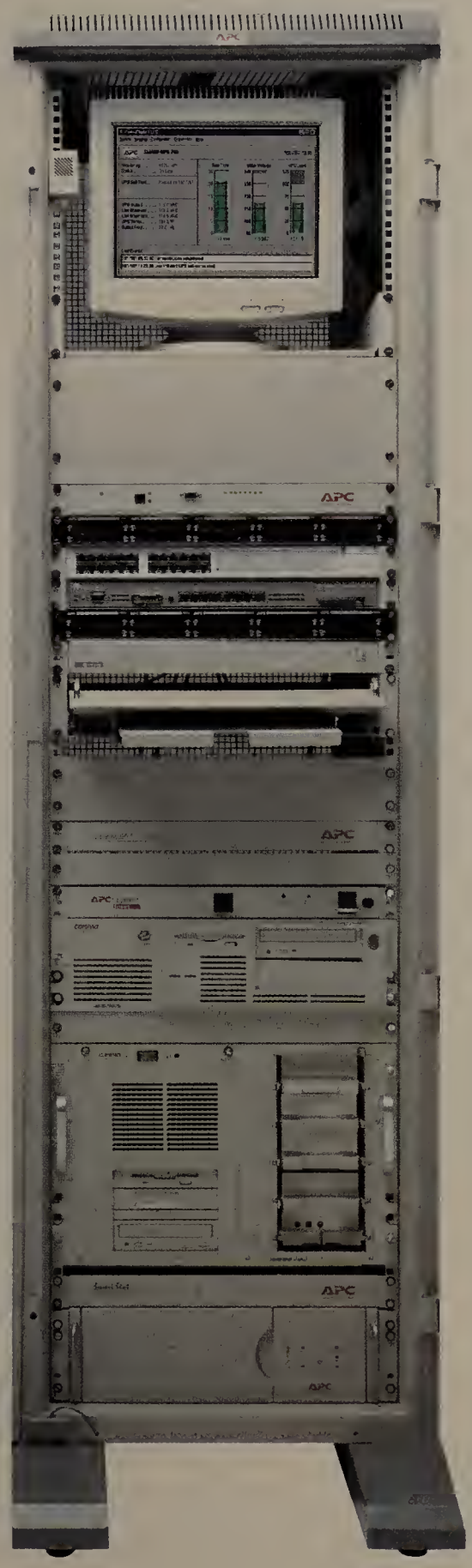

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Digital Link pushes the T-1s that bind

BY TIM GREENE

SUNNYVALE, CALIF. — Digital Link, which made its reputation on DSU/CSUs, is shifting to a new class of WAN gear: inverse multiplexers.

The company's DL5400 MultiLink Access device can logically bond T-1 circuits to form bigger pipes, ranging from 3M bit/sec to 12M bit/sec — all in 1.5M bit/sec increments.

When the box is introduced in August, it will use the multilink point-to-point protocol (MLPPP) to bond the circuits. In the first quarter of 2000, with a change in software, the gear will support multilink frame relay (MLFR), a pending industry standard expected to be approved in August by the Frame Relay Forum.

The equipment is designed for customers who need more than a 1.5M bit/sec T-1 circuit, but less than a 45M bit/sec T-3. Typically, it is less expensive to buy up to eight T-1s than to buy a T-3. Customers can plug up to eight T-1s into the DL5400 and attach the device to a LAN router via the DL5400's 10/100 Ethernet port.

Digital Link's DL5400 bonds T-1 circuits to form bigger pipes.

MLPPP and MLFR will be standards, meaning customers won't have to worry about whether there is another Digital Link box at the service provider end of the T-1 connection, the company claims. The product should work with any standard-based gear from other vendors. With that in mind, Digital Link has tested the DL5400 with a Cisco 7500 router equipped with MLPPP, and Digital Link says they work together. Cisco has not certified the tests. In addition, Digital Link and Ascend have agreed to work to make their implementations of the emerging MLFR specification interoperate.

After proving interoperability with these two vendors, Digital Link will be on its way to supporting multilink services from carriers that already use Cisco and Ascend carrier gear, according to Bettina Tratz-Ryan, an analyst at DataQuest.

Late in 2000, Digital Link plans to add a T-3 interface to the DL5400. The interface will be divided into T-1 channels so that with the cooperation of a service provider, customers can use some of the bandwidth to connect to an ISP and some to connect to another corporate site. The company intends to develop support for inverse multiplexing over ATM, another industry standard for bonding T-1 pipes —only in this case the circuits are ATM. Digital Link also plans to support digital subscriber line technology so customers can use the DL5400 as a DSL modem.

The DL5400 comes in two models: the DL5400 with four T-1 ports costs $12,000, and the DL5400 with four additional T-1 ports costs $15,000.

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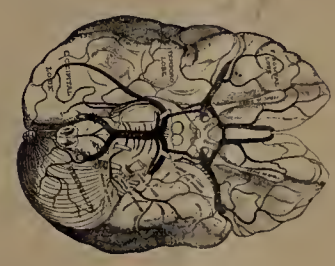

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VOICE OVER IP COMING IN LOUD AND UNCLEAR

Often, when discussing new medical or scientific breakthroughs, ethicists will recommend not pursuing a particular technology because it's in some way morally wrong. The catch phrase for this is: "Just because we can do something, doesn't mean we should."

I think it's time we focused on voice over IP with this phrase in mind — not because there's any ethical problem, but because it just doesn't make sound business sense. I'm reminded of a setup we had when I worked in the old Thomas-Conrad testing laboratory with which we could demonstrate Arcnet connectivity over barbed wire. It worked (just like voice over IP), although not terribly well (just like voice over IP). This test didn't lead to a campaign to network the perimeter of every ranch in Texas, though; it was simply to demonstrate the robustness of the Arcnet protocol. Similarly, voice over IP demonstrates the robustness of the IP protocol. But I'm not ready to throw away my phone just yet — I like being able to carry on a phone conversation that sounds as if I were face-to-face with my correspondent.

This all came up recently at NetWorld+Interop in Las Vegas while I was talking to a representative from Lucent. Lucent and Novell had just announced an agreement to use Novell Directory Services to directory-enable Lucent's Definity switches. Because this will now let you manage your voice and data networks through the directory, it removed the one major benefit I saw for voice over IP: a single point of management. We can only hope the other major phone switch vendors will see the light. Without that compelling benefit, voice over IP returns to being the electronic equivalent of two tin cans and a piece of string. Of course, the Lucent representative tried to sway my thinking. I knew he had never managed a network when he used the argument: "But what will you do with all that unused bandwidth on your data network?" Those of us from the trenches all know that data grows to fill the available bandwidth — always has, always will.

Datacom and telecom have different priorities and strategies. They're like oil and water, and we should never attempt to mix them or disaster may result.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

Tip of The Week

If you've followed my advice and ignored Windows 2000 until now, it's time to start preparing for it. The first thing you'll need to understand is Active Directory, its implementation and implications. Microsoft has posted a large amount of technical information you should download, print and read. Point your browser to www.microsoft.com/technet/deploy/adtech/adtech.htm.

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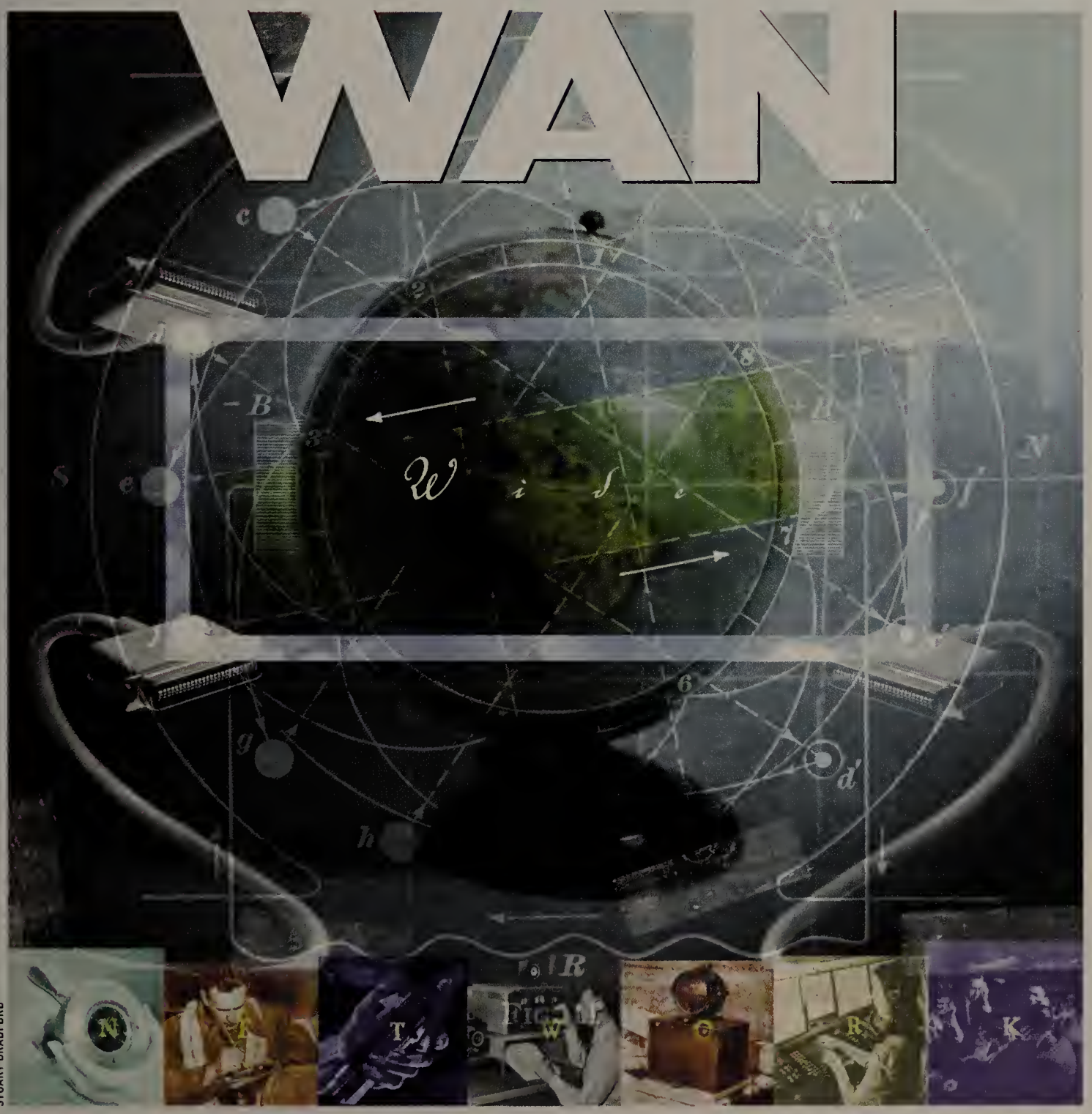
NetworkWorld white paper

A MANAGER'S GUIDE TO THE EVER-EXPANDING HORIZON OF WIDE AREA NETWORK TECHNOLOGIES AND SERVICES

State of the WAN



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BY JIM METZLER

net gain

JAMES YANG

Network convergence offers the potential to run WANs like utilities, and to help network professionals position the network as a bottom-line enhancer.

IT'S NO SECRET THAT the growth of wide area network (WAN) data traffic has rapidly outpaced the WAN budget in most organizations. While data traffic is doubling every year or two, the budget is increasing at a mere single-digit rate. Fortunately, networking professionals have a steadily increasing

Managers At The Demarcation Point Have The Worst Seat In The House.

There's a place where the WAN and LAN meet. It's called the demarcation point. And given the limitations of the control systems available there, it has become a very uncomfortable place where network managers have no choice but to practice "swivel chair management." What a pain.

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WIDER ANSWERS

number of transmission services, as well as a rapidly growing number of Network Service Providers (NSPs), from which to choose.

However, the continued hyperbole surrounding new approaches to networking, as well as the growing spectrum of transmission service and NSP choices, leads to some fundamental questions. When is it appropriate to migrate from one transmission service to another? Is there any reason to implement a converged WAN? How does the networking organization demonstrate the bottom-line value that the network brings to the enterprise?

MAKING A CASE FOR VALUE

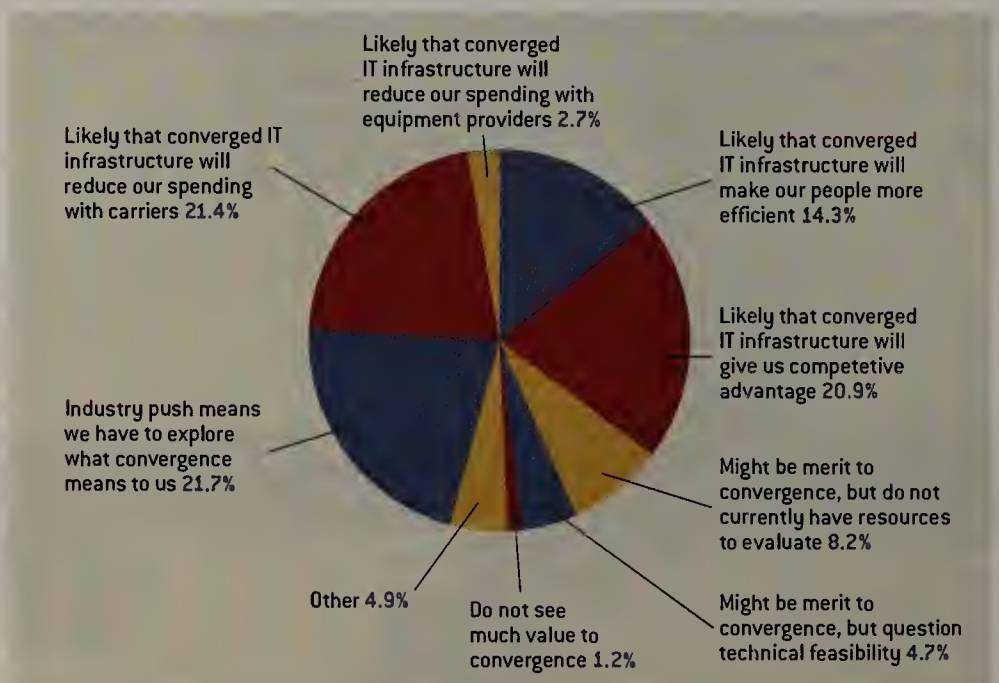
While the vast majority of networking organizations believe that their data traffic is doubling every year or two, very few have done a good job making their case to management for more network resources, both budget and headcount. They have not quantified the rate of increase in their data traffic, nor made this known throughout the company. This lack of a well-understood metric for the rate of increase in data traffic is a scathing comment on the status of proactive network management today. To be successful, network professionals must both develop this metric as well as market the metric broadly within their enterprise.

Network professionals must also continue to demonstrate their value to the organization. In spite of the ubiquitous claim that networking is strategic to business, some networking organizations tend to be regarded primarily as a cost to be minimized.

To change that perception, network professionals must continue to become multi-faceted. They must run the network as a utility—continually driving up the availability of the network, while driving down the unit cost. At the same time, they must identify opportunities in which an investment in the network will help the enterprise become more competitive. One way this can happen is to use the network to establish loyalty on the part of the enterprise's customers, suppliers, and distributors. For example, given the structure of the medical industry, doctors do not generally work directly for health care organizations—doctors can send their patients wherever they choose. Because of this, some leading-edge health care organizations have extended their WAN to reach out to doctors in ways that add value to the doctor's practice.

What drives a company's approach to IT convergence

Which of the following best describes your feeling as to what is driving your company's approach to convergence (n=364)



SOURCE: ASHTON, METZLER & ASSOCIATES AND RENAISSANCE WORLDWIDE

CONVENTIONAL WISDOM DILUTED

WAN philosophy has evolved over the years. In the late 1980s, many enterprises deployed converged WANs based on T-1s and Time Division Multiplexing (TDM). These networks were driven primarily by the fact that at that time, you could not buy fractional T-1 services. Hence, once an enterprise needed a data circuit larger than 64 Kbps, it was forced to buy a T-1. Invariably, the organization then multiplexed both voice and data onto the T-1.

Then in the early to mid-1990s, many enterprises took their data traffic off those dedicated T-1s and put it onto a Frame Relay service. At that time, Frame Relay was limited to T-1 speed and was relatively feature poor. It was essentially X.25 on steroids—the same technology, only somewhat faster and dumber. While this deployment of Frame Relay was beginning, many industry analysts pronounced unequivocally that ATM (Asynchronous Transfer Mode), starting at T-3 speed, would soon be the dominant WAN transmission service.

However, as we have seen with Ethernet, IP, and Frame Relay, once a technology is widely deployed, the networking industry finds techniques to extend its functionality in ways that were once inconceivable. For example, Frame Relay now supports up to T-3 speed and many suppliers have increased the functionality of Frame Relay, most notably by implementing Quality of Service (QoS) techniques. QoS is the capability of the network to provide preferential treatment to certain classes of traffic. And while Frame Relay has been enhanced, many providers now offer ATM at lower speed; i.e., T-1. This evolution of both Frame Relay and ATM has diluted what had been the Conventional Wisdom (CW): If you need a relatively lower-speed WAN service, use Frame Relay. However, once you need a higher-speed service, or QoS capabilities, implement ATM.

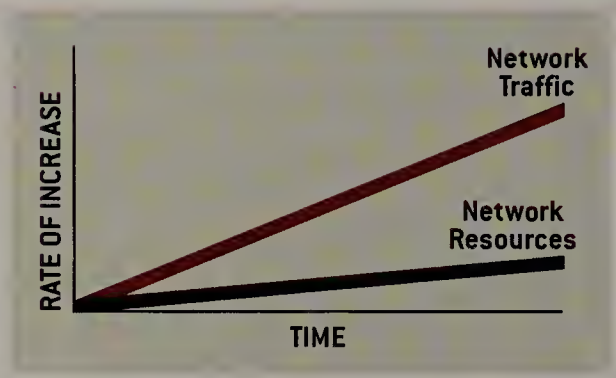
Today's network professionals must update their WAN CW. In particular,

they must carefully analyze if and why they will make the move from Frame Relay to ATM. Driving this analysis will be three things — cost, new functionality such as QoS, and the network management to both control cost and manage the new functionality.

NETWORK CONVERGENCE CIRCA 1999

As previously mentioned, many enterprises deployed a converged network in the late 1980s, only to dis-integrate the network in the mid-1990s. There is a small but growing interest in deploying network convergence again, based on a new set of drivers and a new set of technologies. There are a variety of factors driving organizations to look at network convergence. Roughly one in five (20.9%) network professionals responding to a recent survey is looking at network convergence to give their companies a competitive advantage (see figure, p. 6). Roughly 40% of the respondents are looking at network convergence to help them better run the network as a utility; i.e., make their people more efficient and lower their expenses with the carriers.

Growth in network traffic vs. network resources



Network convergence includes a variety of components, such as LAN convergence, WAN convergence, and converged WAN access. It is often easier to show the cost savings that result from converged access, than it is the converged LAN or the converged WAN.

Converged WAN access refers to the dynamic combination of voice, video, and data traffic onto a single transmission group from an enterprise location to the carrier's Point of Presence (POP). To understand how converged WAN access can help to reduce costs, consider a company that has 200 branch offices with multiple T-1s from each branch office to the carrier's POP. Assume that the average monthly cost of these T-1s is $500 and they are statically configured to carry voice, SNA, and IP traffic. Further assume that by deploying Inverse Multiplexing over ATM (IMA) the enterprise reduces one T-1 per office. This results in a $100K monthly savings, or $3.6 million over a three-year life cycle. If within that company, every dollar of revenue results in 10 cents flowing to the bottom line, then this $3.6 million savings has the same impact on the company's bottom line as $36 million in new revenue.

Network professionals must become increasingly facile with ROI analyses to justify continued investment.

Network professionals will need to determine what components of network convergence, such as converged WAN access, make sense for them at what points in time. However, a word of caution is justified. In order to be successful with the deployment of network convergence, network professionals will most likely also have to implement QoS technology. This will stress most networking organizations' approach to network management in new and very demanding ways.

COMPUTING ROI

In spite of all the deployment of new fiber across the country, the WAN, unlike the LAN, is still characterized by expensive bandwidth. For example, a Fast Ethernet port off a Layer 3 switch can be purchased for under $400. Depreciated straight line over a three-year life cycle, this results in a monthly cost of around $10. A T-1 line from Boston to Dallas would cost around $5,000 per month. The bottom line is that WAN capacity can cost thousands of times as much as LAN capacity.

One of the primary ways that network professionals can successfully convince management of the need for an investment in the WAN is to show the positive ROI that can result. Consider the example given above of deploying IMA to 200 branch offices. For simplicity, assume that the equipment to support IMA costs $6K per office and assume that there are no other costs associated with the implementation. The payback period is the period of time for the savings to equal the cost. In this case, there is a one-year payback period. After a three-year life cycle, there will be a savings of $3.6 million and a cost of $1.2 million. The ROI represents the annual return the company would have to get on the initial investment ($1.2 million) to equal the total savings ($3.6 million) over the life cycle of the investment. In this case, the ROI is 44%.

Network professionals must become increasingly facile with performing ROI analyses as one way to justify continued investment. An ROI analysis can also be used to indicate when it is time to migrate from one transmission service to another.

In addition to learning how to talk the language of business, network professionals must both run their WAN as a utility, and continue to look for ways to use the WAN to help their companies better compete. Network convergence offers the potential to enable network professionals to do both. ◎

Jim Metzler (jim@metzlergroup.com), is a principal in Ashton, Metzler & Associates, Newton, Mass. He is also leading Network World's State of the WAN traveling Town Meeting. Metzler has also worked for multiple carriers, and multiple end-user organizations.

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A DISTANT voice

Sending voice over frames or cells is a likely reality in the not-too-distant future.

BY MARK A. MILLER

FOR MOST NETWORK professionals, converging the voice and data networks conjures up visions of enhanced end-user applications, such as integrated messaging systems, voice-enabled Web sites, or store-and-forward fax service. However, most of these applications have been designed assuming that an Internet Protocol (IP)-based infrastructure is already in place to carry the data. And, given some attention to network engineering and quality of service issues, the voice, fax, and/or video signals can ride on the same network – possibly with little additional expense.

But what if the WAN connection between locations is via Frame Relay or ATM service? Can these same technologies be applied? The

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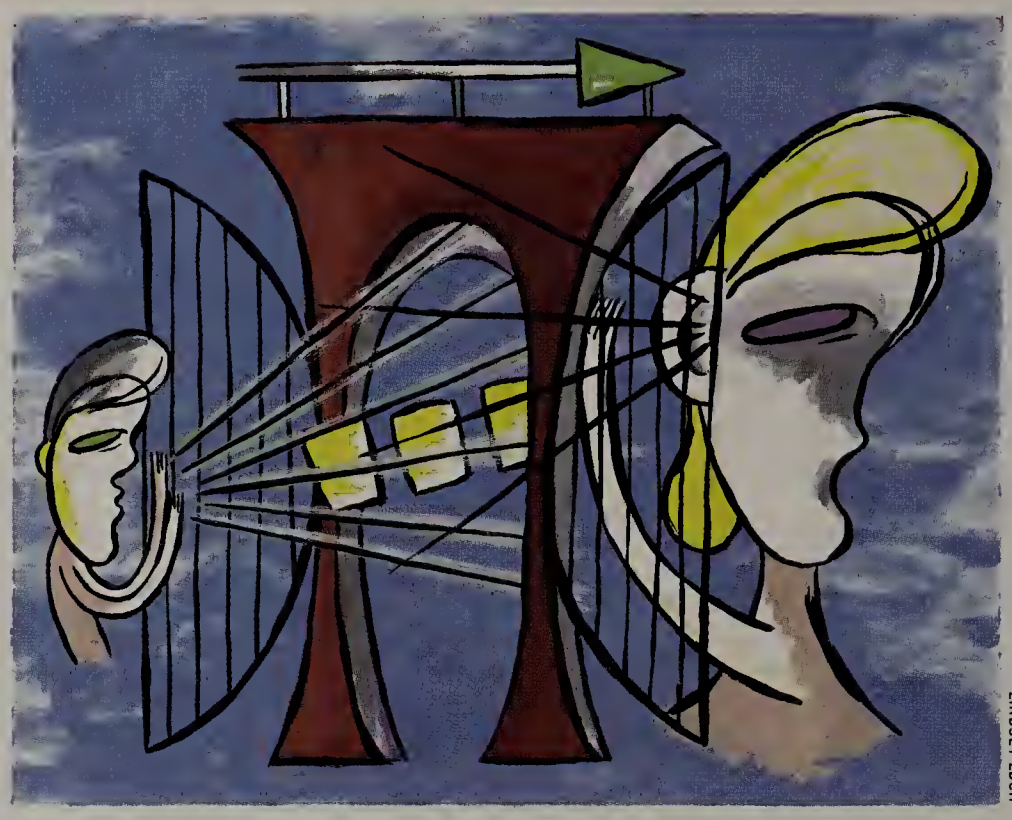

LINDSEY LOCH

It only makes good business sense to put as much traffic over a common infrastructure as possible.

answer is yes, assuming that the savvy network professional does some homework, and understands the various stages that the voice signal goes through.

Much of the signal processing necessary to encode and packetize the voice signal is independent of the actual transport system — the work that needs to be accomplished to send the voice traffic is done so long before it hits the WAN interface. Most of these functions occur in a digital signal processor (DSP) chip that resides in a Voice-over-IP gateway — typically attached to, or integrated in, a digital PBX. In short, the analog signal comes into the gateway where it is processed, divided into packets (or frames or cells), and then sent on its journey down the WAN to the distant recipient.

And many of these DSP algorithms are driven by the end users' requirement for very reliable, high-quality voice service. In other words, they expect the same quality and reliability for Voice-over-Frame Relay or ATM connections as they have come to expect from the existing Public Switched Telephone.

Thus, the common technical challenges of sending packetized voice, independent of the type of WAN transport, include:

- SIGNAL COMPRESSION — packing multiple voice conversations into the typical 64 Kbps voice channel.
- ECHO CANCELLATION — removing the reflected signals that cause distortion.
- SILENCE SUPPRESSION — removing bandwidth-consuming time on the circuit that does not convey any meaningful information.
- DELAY REDUCTION — caused by signal processing and propagation, that make human conversations conflicted.

Therefore, once that analog voice signal has been processed, a good part of the technical work has been completed. What remains at the interface to the WAN are the physical layer transport issues, such as bit timing, call setups, and disconnects; the translations between telephone numbers and WAN addresses, such as Frame Relay Data Link Connection Identifier (DLCI) addresses, and so on. And that is where the Frame Relay and ATM elements come into place, with specifications from both the Frame Relay Forum and the ATM Forum that address that remaining piece of the equation.

ADDRESSING THE ISSUES

The Frame Relay Forum's *Voice-over Frame Relay Implementation Agreement* addresses issues such as the transport of compressed voice within the Frame Relay payload; the compression algorithms that can be used; the transport of signaling information, such as call setup and disconnect messages; the transmission of dialed digits; and sending facsimile data. These functions are incorporated into a Voice Frame Relay Access Device (VFRAD), which would typically sit between the PBX and the Frame Relay network.

Similarly, the ATM Forum's *Voice and Telephony over ATM to the Desktop* addresses the functions to be performed by a native ATM terminal, interworking functions between different types of networks, such as B-ISDN (ATM) and N-ISDN, plus issues of call signaling, quality of service, and so on.

So will network professionals begin to integrate voice, data, fax, and video signals over a common WAN infrastructure? With the majority of the network growth coming from the data — not the voice — side of the house, it only makes good business sense to put as much traffic over a common infrastructure as possible. Continuing improvements in voice coding algorithms, plus end-user-focused initiatives to improve quality of service, should add fuel to the interest in these applications for WAN transport, making sending your voice over frames or cells a likely reality in the not-too-distant future. ◎

Mark A. Miller, P.E., is president of DigiNet Corp., a Denver-based consulting engineering firm providing internetwork design, strategic planning, net management, and product development.

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MEN IN brown

UPS' global IP-centric network, and some smart marketing, have turned the company into an EC gargantuan.

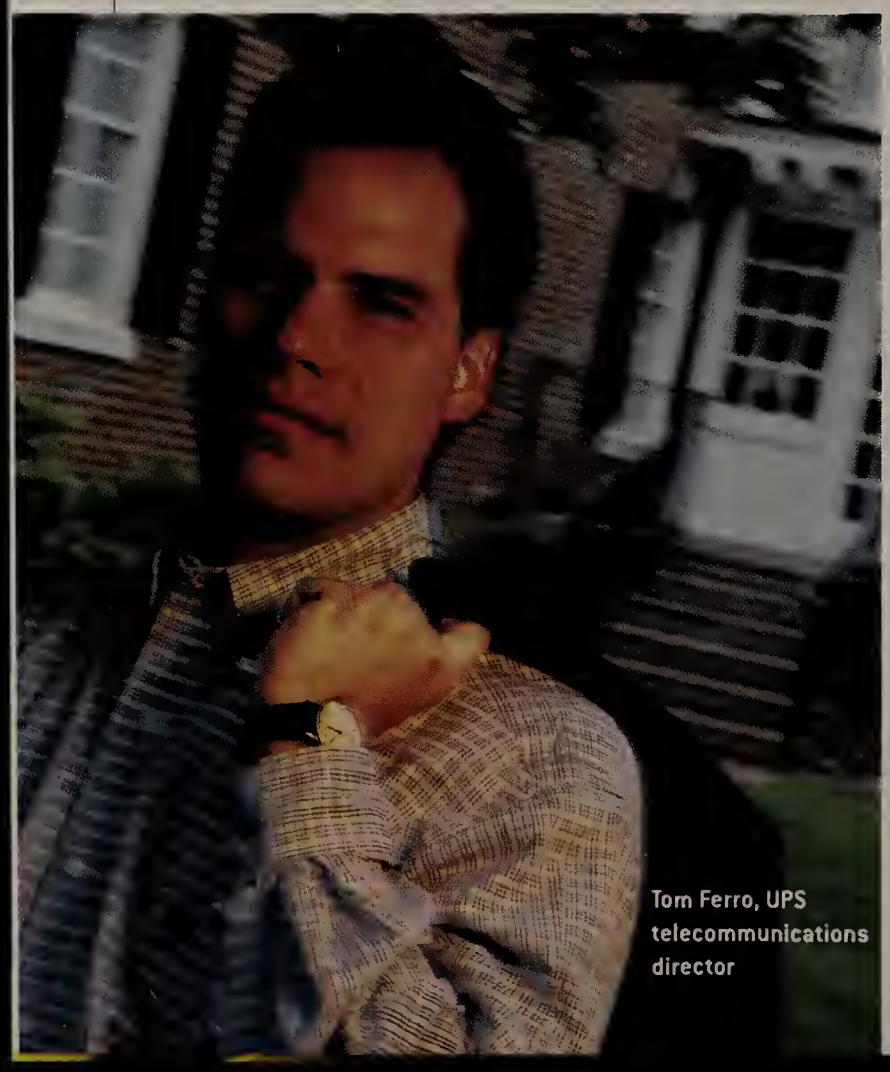
BY DOUG BARNEY

UPS HAS FOUND THAT it's much easier to expand a good network than a bad one.

In this case, a near-total move to IP, a switch to Frame Relay, and the stitching together of a massive cellular data network, have all helped the company march quickly and deeply into uncharted territory.

UPS designers had some very specific goals in mind, goals that only a guaranteed bandwidth technology such as Frame Relay could deliver. The Atlanta-based company wanted to exceed FedEx's package tracking, offer just-in-time shipping, support Web access and Web transactions, and provide new services that UPS deep thinkers had not yet even imagined.

The Web, for one, proved the IP bet sound. All the company's planning and all of its IT investments—some $10 billion over the last decade—paid off last December when UPS handled a record one million tracking requests from the Web in one day.



Tom Ferro, UPS telecommunications director

BOB RIVES

The State of the WAN

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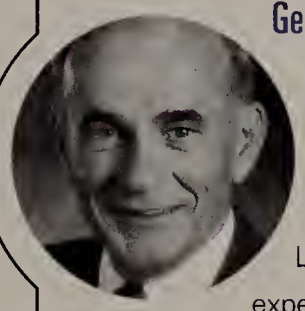

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Larscom Incorporated, the industry expert in inverse multiplexing technology, has expanded the market for ATM-based services by delivering high-end customer premises equipment (CPE) for Inverse Multiplexing for ATM (IMA) using common T1/E1 lines. Larscom's new Edge IMA Multiservice Access Concentrators enable service providers to deliver critical integrated ATM services such as Virtual Private Networking and combined voice/video/data packages to customers without the difficulty and expense of locating dedicated fiber connections.

NetworkWorld white paper

4/99—DK—00048

That kind of traffic wasn't a total surprise. For one, it was the holiday season. And UPS had been aggressively tying its affiliated retailers, both conventional and Web-based, directly into the UPS Internet operation. In short, UPS' global IP-centric network, and some smart marketing, have turned the company into an EC gargantuan.

FIGHT FOR THE FUTURE

Like many growing concerns, UPS in the past had added networks pell-mell, each designed to solve a specific problem. By 1991, those networks had melded into a pretty decent private packet net that helped the company make its initial global push. This X.25-based net worked, but each new location meant UPS had to get some kind of dedicated line and establish a private connection. And the data did not move around quite as fast as UPS liked.

The company continues to prepare its WAN for a future where buying will be more virtual than physical.

In the early '90s UPS began to switch over to Frame Relay, first by building a private Frame net. At that time UPS began using IBM equipment such as the Nways 2210 access router. UPS chose IBM because it handled new-style traffic such as IP as well as the tried-and-true SNA. It now has some 2,060 of the IBM devices

UPS made its technical move not a moment too soon. The company, founded in 1907 by a Seattle teenager, was facing the fight of its life with Federal Express, which was aggressively marketing its ability to track packages. A brilliant network was the key to FedEx's phenomenal tracking, and a brilliant network would be the base upon which the men (and women) in brown would give its remarkable answer.

The UPS team that designed the new architecture thought just as radically as the company's hyper-aggressive rivals. They were willing to throw out perfectly functional technologies whose futures were in doubt. And they pledged to adapt things that they couldn't simply give up, like SNA, to the new UPS architecture, dubbed the UPS Global Telecommunications Network. And when you are talking about more than 200,000 PCs, 3,500 LANs, and 14 mainframes, making these kinds of architectural shifts is no trivial matter.

But that didn't stop UPS. It moved most of its traffic to IP, pretty much wholesale. While there is still a small smattering of IPX, all new applications over the last several years have been built with IP firmly in mind. "We've had some stragglers, but basically in '96 and '97 we moved our main apps over to the IP network," explains Tom Ferro, the 27-year old telecommunications director for UPS.

GOING GLOBAL

To keep pace with its competition, and to usher in an era of true worldwide electronic commerce, UPS needs blanket coverage, which means having information systems in remote locations that are equal to their U.S. counterparts. This type of expansion, using old-style proprietary solutions, could take decades, and quickly sap UPS' annual billion dollar-plus IT budget.

But by building on standards, and lessons learned from a network that has already revolutionized the package delivery giant, UPS' expansionist ambitions are sure to be realized as well.

While UPS does business in over 200 countries, it is not fully automated in all of them. Its biggest areas of coverage are North America and Europe. Here, with a smart architecture and partners in place, expansion is fast and easy. Supporting new locations in Western Europe, say an outpost in Limerick, is as easy as calling up the Global One consortium (sending an e-mail is more like it). Global One, a joint venture between Deutsch Telekom, France Telecom, and Sprint, based in Brussels, can install a Frame Relay port or two (UPS already has over 400 around the world), and get UPS up and running in no time.

These standards are easing the company's push into Asia, where it uses SITA, a Geneva-based telecommunications provider to the transport industry, for its WAN services, and where UPS this year is completing an expansion to 77 locations. The company is also driving deeper into Latin America and the Middle East, where it uses a combination of SITA and Global One. "At this point we have a fairly cookie cutter approach to expanding the network. We have been able to leverage Frame Relay in many of the countries we are expanding in," says Ferro.

In Latin America, where UPS had been unable to get any wired service until recently, Frame Relay is replacing VSAT (Very Small Aperture Terminal). "These are pretty much cut-and-dry installations," Ferro says. And with Frame, the networks are running better. "Mexico, which traditionally had very unreliable service, has become very reliable," Ferro explains.

WIRED DRIVERS

IP and Frame Relay are fine for basic expansion. But a remarkable approach to wireless data helps UPS drive into truly obscure places. And with over 70,000 vehicles, those places are getting easier and easier to reach.

UPS equips its trucks with wireless units that transmit, in real time, the whereabouts of packages, a process that involves over a million cellular calls every day.

Getting that kind of volume and coverage wasn't easy. UPS had to cajole over 100 separate carriers in North America to blend their networks to carry this traffic. Although UPS and its partners used a few error control tricks to move data reliably across the "noisy" analog voice network, the bulk of the technology is strictly off-the-shelf. Across the pond, UPS uses wireless radio technology for some 5,000 European vehicles.

All this wireless data is fed into the UPS land line net. This way, customers tapping into the UPS network, whether through a quick phone call, a direct connection, or through the company's busy Web site, can find out where their package is, and if delivered, precisely where and who signed for it.

continued on page 22

The State of the WAN

Executive Profiles

(continued)

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how to negotiate —and enforce— iron-clad SLAs

Network professionals need to continue to protect their companies from the cost of downtime.

BY JOANIE WEXLER

IT IS QUICKLY BECOMING status quo for network professionals to establish service-level agreements (SLAs) with their WAN service providers. SLAs that guarantee certain network performance levels are growing in importance because business-critical traffic is now moving onto services such as Frame Relay and ATM, and it is the job of enterprise network professionals to protect their companies from productivity and revenue losses caused by network outages and delays.

In fact, now that the time-sensitive back-end processes that companies rely on to run their businesses—transaction processing, enterprise resource planning (ERP), even some voice traffic—are moving onto Frame Relay and ATM networks, the cost of downtime or service degradation is skyrocketing. Infonetics

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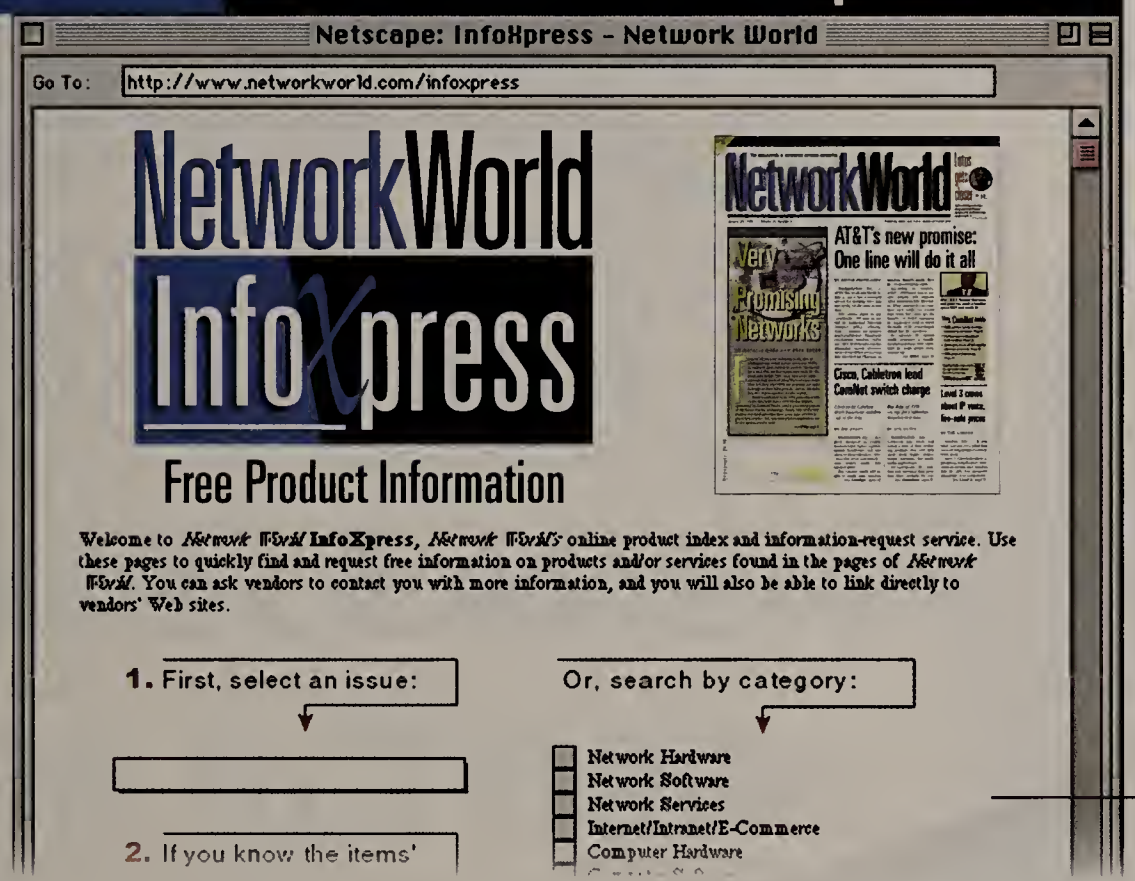

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The bottom line on network availability

Lowering availability guarantees by mere fractions of a percent can quickly increase your exposure to uncompensated network downtime.

NETWORK UPTIME	DOWNTIME PER MONTH	DOWNTIME PER YEAR
99.99%	4 minutes	48 minutes
99.9%	43 minutes	8.6 hours (about 1 business day)
99.5%	3.6 hours	43.2 hours (about 1 business week)
99%	7.2 hours	86.4 hours (more than 2 business weeks)

*Presumes a 30-day month

Research, Inc., San Jose, Calif., for example, estimates that the annual cost of produetivity lost to WAN outages or bottlenecks for an average enterprise is $3.6 million.

To minimize these losses, customers are partnering with their network service providers to specify thresholds for network downtime (availability), packet/cell loss (data delivery ratio, or DDR), and delay (latency/throughput) to ensure that each networked application performs well and user productivity remains high. Under these contracts, the service provider promises to adhere to minimum performance levels for the above metrics, or pay the customer a penalty at the end of the month.

In addition, jitter (the variation in average delay) can affect some applications, such as voice or real-time multimedia collaboration applications. In the ATM world, this becomes an issue if your carrier does not offer the constant bit rate (CBR) class of service to satisfy these applications. Guarantees surrounding jitter are not generally included in standard SLAs and must be specifically negotiated.

SLAs also often address customer service criteria, specifying the maximum amount of time it will take to provision a new service or make additions to an existing service. Maximum restoration time, how quickly the carrier will notify you of a network problem, and how quickly the carrier will respond to a customer maintenance dispatch are generally also included.

10 TIPS FOR SUCCESS WITH SLAs

While most large service providers include standard SLAs with their Frame Relay and ATM services (see chart below), these guarantees may not quite fit the requirements of your traffic mix. Most providers will negotiate a custom SLA if pressed, especially if you are a large customer. Here are some tips for getting yours right:

1 Verify that you have an end-to-end SLA by reviewing the components covered. For example:

• Is the access link included? If not, this can be a significant drawback, since the access network is generally the network component most vulnerable to outages. A high degree of uptime for only part of the network doesn't help you protect against productivity losses.

• Does the SLA apply to your company's network or to the service provider's customer base as a whole? "Those that offer average performance guarantees to the entire user base are not all that valuable," notes Bill Flanagan, program director at NetReference, Inc., a Sterling, Va.-based consulting firm focused on network architectures. For example, if a service provider promises 99.5% average network uptime per month, your own network service could be hovering around 99% on average (nearly a day of downtime per month), while other customers are enjoying 99.99% average availability (about 4 minutes of downtime per month).

• Does the guarantee apply network-wide or on a site-by-site basis? "Negoti-

Off-the-shelf SLAs: who offers what?

The language carriers use to describe their SLAs often conflicts, so it is important to nail down your provider on specifics.

BASIC SLAs FOR ALL CUSTOMERS*

	AVAILABILITY		MAXIMUM DELAY		DATA DELIVERY RATIO	
	Frame Relay	ATM	Frame Relay	ATM	Frame Relay	ATM
AT&T	99.99%	99.99%	60 msec (one-way)	120 msec (roundtrip)	99.99% at or below CIR	99.99% at or below CIR
MCI WORLDCOM	• 99.99% (core only) • 99.9% (end to end, with access link included)	• 99.99% (core only) • 99.8% (end to end, with access link included)	60 msec	Not specified	99.99% at or below CIR	Not available
SPRINT	• End to end: 100% if Sprint provides access link; 99.9% if using traditional RBOC access. • Core only is covered if customer supplies	Same as Frame Relay	55-130 msec one way, end to end, depending on CIR and service class	• CBR: 36 - 40 msec, one way, end to end, depending on CIR • VBR-nrt: 46-50 msec, one way, end to end, depending on CIR	• 99% (0 CIR) • 99.9% (with CIR)	• CBR: 99.99% • VBR-nrt: 99.9% • UBR: 99%

Key: CIR: committed information rate, CBR: constant bit rate, VBR: variable bit rate, UBR: unspecified bit rate, nrt: non-real-time
*Carriers' lists also offer standard SLAs for mean time to repair, provisioning, and outage notification times.
SOURCES: AT&T, MCI WORLDCOM, SPRINT

Colin's years of editorial experience means he knows what it takes to produce a quality publication. As President and CEO, Colin ensures Network World, Inc. fulfills its vision of being the leading provider of network knowledge.

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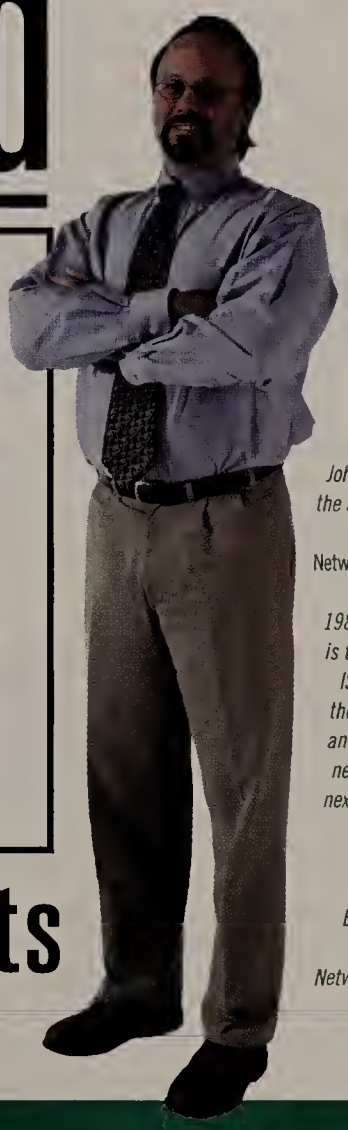

John has directed the award-winning editorial for Network World *since its premiere in 1986. His mission is to give Network IS professionals the news, insight and analysis they need to build the next generation of networks.*

John Gallant
Editor-in-Chief/
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ating a higher availability for each component bodes better for individual users," notes Liza Henderson, director of consulting at TeleChoice, Inc., a telecommunications consultancy headquartered in Verona, N.J. For specific critical ports and permanent virtual circuits (PVCs), such as those linking to a hub/headquarters site, you might want to specify more stringent performance parameters, she advises.

2 Make sure you know your obligations. Must your network remain at a minimum size for the SLA to be in effect? Or, if you are under a usage-based pricing plan, do you have to transport a minimum volume of traffic in a given month?

3 For Frame Relay services, use standard terminology as specified in FRF.13, the Frame Relay Forum's Implementation Agreement (IA) for Service Level Definitions (www.frforum.com). FRF.13 helps to define Frame Relay SLA parameters and enables the industry as a whole to be consistent in its language when specifying network service parameters. This better equips you to make apples-to-apples comparisons among service providers.

4 Profile your usage and match per-PVC delay requirements to your application. Using performance monitoring and reporting tools, such as smart Channel Service Unit/Data Service Unit (CSU/DSU), get to know your applications and the conditions under which they perform best. Negotiating the tightest possible delay for voice makes sense, but when a particular PVC will be used for file transfers, why pay extra for an SLA when a few extra milliseconds won't really matter?

5 Repeat No. 4 at regular intervals. Every time you add new applications to your network, you will affect the performance of the existing applications.

6 Ask about more granular SLA elements. For example, when negotiating network uptime, the specific hours that the network is available—such as 9 a.m. to 5 p.m.—might be just as important to you as the overall percentage of uptime. "On the other hand, if I run database backups in the middle of the night, I might want to negotiate stricter network availability on a particular PVC from 2 a.m. to 6 a.m," says TeleChoice's Henderson.

7 Nail down network performance measurement methods with your carrier. For example, Henderson notes, "While [FRF.13] defines how to measure a parameter 'over time (T),' it doesn't specify whether 'time (T)' is a month, week, day, or minute."

8 Consider a network-independent method for monitoring your carrier. Most carriers will supply monthly reports about usage and performance, but generally, unless you have purchased a managed network service, these reports won't give you the entire picture, because they are focused only on the service provider's backbone.

9 Know where the demarcation of responsibility lies. Are your CSU/DSU, Frame Relay Access Device (FRAD), and router included in the guarantee? Remember that not all application performance problems have to do with the WAN service (though 61% do, according to Infonetics). Maxed-out server capacity or inadequate router CPU power can also be the culprits.

10 Read the fine print. Remember that the network professionals' bottom-line goal is to ensure application performance, not to amass service credits that generally won't make up for losses incurred by network problems. Still, the very fact that service providers are being pressed to offer service-level guarantees is driving them to suitably engineer their networks to avoid the penalties. So don't be shy. Ensuring that your carrier delivers what your applications demand is doing you and the rest of the industry a favor. ◎

Joanie Wexler is an independent editor based in Campbell, Calif., who covers computer networking and information technology topics. She can be reached at joanie@jwexler.com.

STATE OF THE WAN
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Men in brown

continued from page 16

BOLD NEW SERVICES

Expansion means more than gaining coverage in Timbuktu, Pago Pago, and Katmandu. For UPS, it means bold new services—services that have more than answered the challenges of new Web-based concerns.

Its network savvy and solid infrastructure have allowed UPS to become a bit of a carrier itself. Through its UPS Telecommunications Inc. subsidiary, the company offers dedicated lines for its biggest customers, allowing them to access UPS applications, conduct Electronic Data Interchange (EDI), gain the ability to connect multiple customer sites, and of course, track packages.

Other services include:

- The recently announced UPS OnLine Tools, a set of seven programs such as address validation and electronic manifesting.
- UPS Document Exchange, which verifies electronic document delivery.
- UPS Internet Shipping, a system that does away with paper forms entirely. This is in beta test.
- Host Access, a service that ties a customer directly into the massive IBM DB2 mainframe database, one of the largest DB2 databases in the world, according to UPS.

PLUGGING INTO CUSTOMERS

UPS today is the proud owner of a massive network with a satellite and over one-half million miles of lines. But this impressive feat is only the beginning. The company continues to prepare its WAN for a future where buying will be more virtual than physical. According to a speech earlier this year by Jim Kelly, CEO of UPS, "Already, more than half of our package volume is shipped to customers who are electronically connected." Kelly concludes, "Either we can plug into our customers, or our global competitors will."

And as the company already knows, once a good network is in place, anything is possible. ◎

Doug Barney is executive editor, news, for NetworkWorld.

BY JEFFREY M. KAPLAN

A scorecard

FOR THE NEW WORLD SERVICE PROVIDER MARKET

TALK ABOUT CHANGE occurring in Internet time! Long a staid area dominated by one player, the telecommunications industry is undergoing an incredibly rapid transformation that is spawning a new generation of "service providers" aiming to steal a share of the booming services market from traditional, incumbent players. One look at the chart below reveals just how this market has exploded in a few short years.

With voice traffic only growing at 7% per year while data traffic triples every year, IP-based networking traffic will exceed voice traffic in five to seven years. So it's easy to see why nearly all service providers are aggressively developing and implementing data services.

This is mostly great news for enterprise customers, because more players means more services and products and, generally, aggressive price competition for those services. With the array of players growing and the alignment of these carriers constantly in flux, commercial and residential customers alike are well-advised to do their homework before selecting the right service provider to meet their needs. The first step is to carefully evaluate your networking requirements.

Examine your relative voice, data, and IP networking needs. Look at your volume levels and geographic calling patterns. Determine your security, reliability, and customer support needs. And remember that selecting a service provider based on price before you consider all the other variables will ultimately increase your networking costs by forcing you to expend twice the energy policing your provider and repairing the damage from second-class service.◎

Jeff Kaplan (jeff_kaplan@ins.com) is the director of strategic marketing for International Network Services, a network consulting and software solutions provider.

Service provider competitive matrix

CATEGORY	MAJOR PLAYERS	STRATEGIC DIRECTION	STRENGTHS	CHALLENGES
INCUMBENT INTEREXCHANGE CARRIERS (IXCs)	AT&T, MCI WorldCom, Sprint, GTE, BT	Diversifying into new IP/data services; Pursuing local access via acquisition; Expanding worldwide capabilities via alliances	Large installed base of customers; Existing back office and network facilities; Geographic scope	Legacy voice orientation; Some legacy management
INCUMBENT LOCAL EXCHANGE CARRIERS (ILECs)	Ameritech, Bell Atlantic, BellSouth, USWest	Developing new IP/data services; Broadening local base via mergers; Lobbying for right to offer competitive long distance services	Large installed base of customers; Existing back office and network facilities; Geographic scope	Legacy voice orientation; Some legacy management
LOCAL CHALLENGERS/ COMPETITIVE LOCAL EXCHANGE CARRIERS (CLECs)	Facilities-based Resellers, DSL, Wireless Providers	Rapid deployment of new generation IP/ data delivery facilities; Offering innovative packaging of voice and data services; Partnering with other CLECs and Bandwidth Barons to offer long distance services	IP/data service orientation; Greater customer focus; More responsive to new market demands	Limited experience; Lack of skilled staff; Tenuous financial position
CABLE OPERATORS	AT&T-TCI, Comeast, MediaOne, Roadrunner, @Home	Expansion of high-speed voice/data service capabilities; Positioning to compete for ISP opportunities; Seeking broader geographic reach via mergers/acquisitions	Broadband service capabilities; Potential converged services (voice/data/video)	Poor customer service reputation; Limited technical skills; Lack of back office infrastructure
INTERNET SERVICE PROVIDERS (ISPs)	AOL, Concentric, Exodus, Navisite, PSInet, Uunet	Developing new generation of packaged applications and outsourcing services; Pursuing voice over IP (VoIP) telephony services; Pursuing e-commerce opportunities	IP/data service orientation; Focus on applications vs. network infrastructure; Financial leverage from strong stock market	Lack of telephony experience; Limited onsite support capabilities
BANDWIDTH BARONS/NEW PUBLIC NETWORKS	IXC, Frontier/Global Crossing, Level 3, Qwest	Rapid deployment of high-speed, fiber backbone facilities; Pursuing distribution agreements with utilities, CLECs, and ISPs; Competing for commercial and residential service opportunities	Focus on backbone capabilities; Proven management skills; Strong business relationships	Limited staff skills and resources

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QUACKING ducks ARE JOB 1

BY DAVID RHODE

WANT TO CAPTURE SOME high-profile attention for your new national carrier? Dig up a few thousand miles of railroad right-of-way, buy a few dozen gigabit switch routers, and tell everyone you've got a brand new national IP network. Then, to actually get some customers, install a parallel Frame Relay/ATM network.

You can be forgiven if when I say "Qwest," you immediately think of its new IP network based on dozens of Cisco's monster GSR 12000 routing switches, rather than its other, parallel network — 28 heavy-duty Ascend Frame/ATM switches.

But it's those Ascend ports that are filling up with permanent virtual circuit terminations, as Qwest signs corporate contracts listing Frame Relay as the initial backbone service. Why is Qwest pursuing Frame Relay when IP virtual private networks are the future? CEO Joe Nacchio replies: "It's called feeding the quacking ducks."

The other carriers know it, too. AT&T Chairman Mike Armstrong says his global venture with British Telecom, anchored by the purchase of the IBM Global Network, will produce a seamless global IP network. But Job 1 is to rationalize the more established players' collection of Cisco and Ascend Frame/ATM switches from different generations into one global packet network.

Here's where Qwest and other new carriers have an advantage. While new applications, particularly e-commerce, are going to IP intranets and extranets, corporate network administrators find that when it's time to migrate existing corporate WAN apps beyond standard T-1 Frame Relay, the choice so far is usually ATM.

Rather than carrying glorious multimedia traffic in real time, users found that ATM could be installed at the core of a purely data Frame Relay WAN, and it would still look like one network. Data centers and regional HQs could subscribe to a T-3 or fractional T-3 carrier ATM port, branch offices could choose 56K to T-1 Frame Relay, and the whole thing would interoperate.

PRICEY PATCHWORK

But a virgin network like Qwest gets to do this via a single, unified platform, while the older carriers have to patch together older Frame/ATM interworking. This patchwork helps explain why Frame Relay prices are still high. For a basic, 56K Frame Relay branch port, expect to pay around $300 a month with an older carrier. Yet Qwest charges less than $200 and some local carriers charge barely over $100.

What's more, Frame Relay — which practically demands long-distance SONET transport because its very essence is the lack of packet-by-packet error correction — has practically required the national carriers to invest billions in new fiber. As a result, the service comes with all kinds of "extras" to recoup that cost.

But intracorporate WAN traffic is not where networking is going. In the new world — where your network may have to reach all your suppliers, all your frequent customers, or perhaps even the whole country — Frame Relay and ATM have fallen short.

Only MCI WorldCom and Qwest have even announced switched virtual circuits – the ability to dial up any Frame Relay site from any other and pay according to usage – and even SVCs require some Frame Relay CPE (Customer Premises Equipment). That's left early extranet users with a dilemma. Some big travel networks, for example, have gone through the trouble of outfitting thousands of travel agencies with Frame Relay PVCs. But that's meant going through the nightmare of scheduling dedicated access lines and CPE installations through recalcitrant RBOCs and local installers of various competence.

The easier path is evident: a dial-up public Internet connection for all outside users into a secure IP VPN. The quality of service isn't there yet, but if IP providers get their act together, Frame Relay will finally be challenged as the WAN protocol of choice — and Joe Nacchio will get to feed his quacking ducks exactly what everyone thought they were asking for all along. ◎

David Rhode is a NetworkWorld *senior editor covering services, telecom equipment, and regulatory issues.*

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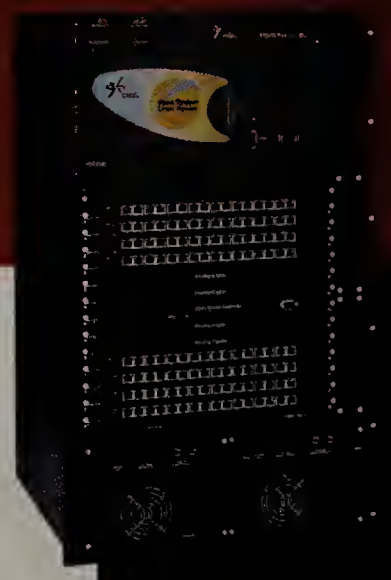

On April 5,1999 NBase-Xyplex introduced the first Open System Switch Router to use the Linux operating system. The Linux Router delivers the horsepower needed to address tomorrow's Internet requirements. Editors,Analysts, and the Linux community have enthusiastically responded.

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Carriers & ISPs

The Internet, Extranets, Interexchange and Local Carriers, Wireless, Regulatory Affairs

Briefs

MCI WorldCom, already the largest reseller of **SkyTel** paging services, has decided to buy the company. The carrier will pay $1.3 billion in stock and assume $525 million in debt in exchange for SkyTel's 1.6 million subscribers.

The deal was helped by some hometown connections: Both companies have their corporate headquarters in Jackson, Miss.

AT&T and **Unisource** last week said they have agreed on terms to allow the U.S. carrier to drop out of its joint venture with the European telecom alliance. Neither the terms nor the timing of the agreement were disclosed.

The move follows AT&T's announcement in July 1998 that it would withdraw from the venture, called AT&T Unisource Communication Services (AUCS), by July 2000. That decision came after AT&T entered into a global alliance with British Telecommunications and chose to disengage itself from its other less-than-spectacular international ventures with Unisource and Global Partners. AT&T owns a 60% share in AUCS, and Unisource — a consortium made up of SwissCom, Telia AB of Sweden and Koninklijke KPN of the Netherlands — owns the remaining 40%.

Last month, a rescuer was found for AUCS, when Infonet Services agreed to acquire AUCS' business operations and assets.

AT&T is also working to disengage itself from Global Partners, an alliance that includes members such as Japanese carrier Kokusai Denshin Denwa and Singapore Telecommunications.

Wireless carriers want space on your roof

Wireless local loop carriers seek regulatory help to reach office building users.

BY DAVID ROHDE

WASHINGTON, D.C. — New wireless carriers looking to bypass local Bell company loops and link users directly to long-distance broadband networks say they need a little help from the government.

The carriers are asking the Federal Communications Commission to force commercial real estate owners to let them install antennas on rooftops and offer building tenants a choice of local loop technology.

But these carriers, such as Winstar Communications and Teligent, are preparing for a fight from the 17,000-member Building Owners and Managers Association (BOMA), which says the FCC has no business regulating private property owners.

At stake are connections to hundreds of thousands of branch offices located in multitenant office buildings. The carriers' trade association, the Personal Communications Industry Association (PCIA), says many building owners are shutting out the new wireless carriers. The association claims building owners are demanding unreasonable fees for antenna installation or charging users additional fees if they choose a wireless carrier over a Bell company.

As early as this week, the FCC may release a notice that it is considering a building-access rule and requesting comment, sources say. Without FCC action, the new carriers — which typically sell broadband local voice, data and Internet access via 38-GHz and other microwave spectrum — say they must fight battles with individual building owners before they can reach users.

"A company such as Winstar literally has to market its services building by building," says Brent Weingardt, vice president of government relations for PCIA. "The company does it the old-fashioned way."

The building owners say that's exactly how the market should work. Just last week, BOMA officials point out, Winstar announced a deal with a real estate investment trust called Crescent REIT, which chose Winstar as a preferred supplier in up to 70 buildings. That deal echoed a number of other recent announcements.

"They're going to have a hard time demonstrating that the market is working against them," says Gerry Lederer, BOMA's vice president of government and industry affairs. "We encourage our

See **Wireless carriers**, page 34

A welcome mat for everyone

Wireless local loop carriers want to establish the following national rules for access to multi-tenant buildings:

1. Each user company should have the right to choose its own local carrier.
2. Building owners should be prohibited from signing exclusive contracts with carriers.
3. Owners should not charge users higher fees for choosing one carrier over another.
4. All carriers should get "reasonable accommodation" for their equipment in common building space.
5. Building owners can charge carriers for space, but those charges should be nondiscriminatory.

New services put callers on the map

BY TIM GREENE

Customers who need to know where corporate phone calls are coming from and going to can tap into new services offered by US WEST !nterprise and Cincinnati Bell.

The services give customers reports, either on disk or via a Web page, of phone use by geographic area, time of day and call duration. The results are displayed on maps, charts or graphs.

The services can also measure whether calls are answered, get a busy signal or ring until the caller hangs up.

Call Reports and Call Graphics, the services from US WEST, monitor call center activity for Love Lines, a Christian outreach group in Minneapolis, according to Athena Homer, the group's personnel director.

One benefit is that Love Lines can measure the impact of advertising. For example, when the group's phone number was flashed on the screen during the *Jerry Springer Show,* Homer was able to use the reports to show how many calls came in as a result; she found out that half the calls went unanswered.

Before the service, Love Lines also had no idea how many people received busy signals during peak calling periods, Homer says. With the service, she has been able to fine-tune staffing levels so more calls get answered.

US WEST says businesses can also use the reports to gauge the impact of print advertising. Using different phone numbers in different ads lets customers track which calls are the results of which ads.

Marking the source of calls on a map helps customers see where demand is originating, and that information can help them determine where to open more stores or offices, US WEST says.

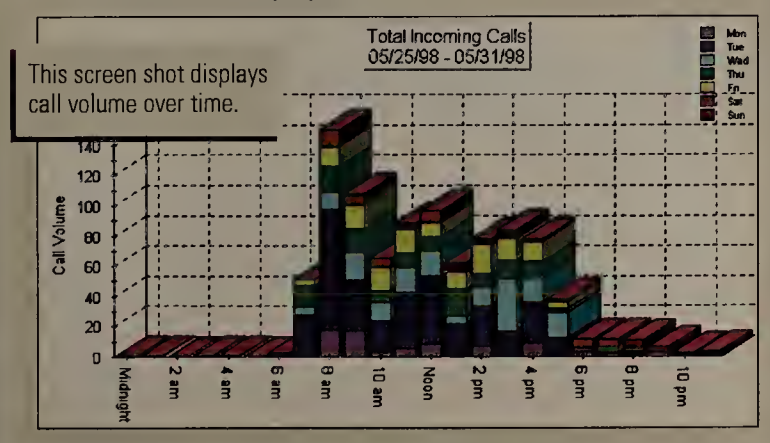
Love Lines also uses the service to track frequent callers so they can flag those who might need more help.

Cincinnati Bell's new service is Call

See **US WEST**, page 34

Look who's calling

OneLink's TeleSmart software supports US WEST and Cincinnati Bell services that graph phone use.



Every page brings another issue to be resolved. But it doesn't always have to be that way. You see, Sprint Frame Relay Service is ranked first in customer service*, monitored 24/7 and backed by industry-leading Service Level Agreements. Sign up now to get a 60-day trial offer and see for yourself.**

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Wireless carriers,
continued from page 31

members to use a second or third [local access] provider."

The dueling parties are playing hardball. If Congress or the FCC forces building owners to provide entry for all potential carriers, building owners may ask for a reverse mandate — that wireless local loop carriers place rooftop antennas on any building whose owner asks for it, Lederer says.

BOMA also has placed an "International Call to Action" on its Web site asking members to sign a form letter to Congress. The letter claims that "forced building entry" by telecom carriers that may or may not have bonded and insured technicians could be "dangerous to building occupants and dangerous to real estate development."

Using this kind of technique, BOMA has helped defeat proposed mandatory rooftop access laws in Virginia, Florida, Indiana, Iowa and Colorado. Carriers have won building-access mandates in Connecticut and Texas, and a building-entry law is now making its way through the California legislature. But carriers say they would prefer a national standard.

"There's no doubt that the property owners feel they are in the driver's seat," says Harry Hirsch, CEO of Advanced Radio Telecom (ART), an emerging wireless local loop provider.

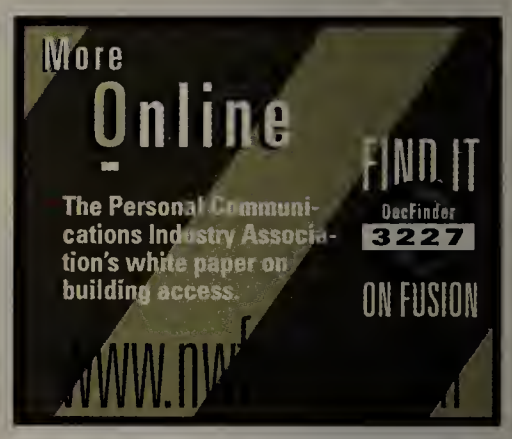
Some success

Yet Hirsch says ART has succeeded in winning a number of "master contracts" — deals with owners of multiple buildings — in its original three markets of Seattle, Phoenix and Portland, Ore. Last week, ART got a vote of confidence in its ability to market its services: Long-distance carrier Qwest took a 19% stake in the company.

PCIA says the FCC has precedent for expanding its regulation. Association officials point to an FCC requirement that pole attachments owned by electric utilities be made available to telecom carriers for wireless and other equipment.

Building owners counter that the agency has more justification for regulating utilities than private property owners.

"There's a big difference when you're a regulated entity like a phone company or electric utility," BOMA's Lederer says. "We didn't use guaranteed rates of return to build our buildings. We built them ourselves." ◪



US WEST,
continued from page 31

Analysis. The software backing the US WEST and Cincinnati Bell services is called TeleSmart and was written by OneLink in conjunction with US WEST. TeleSmart draws on call information gathered by phone switches.

OneLink also operates TeleSmart Service Bureau, where it takes switch information from carriers and turns it into reports for delivery to the carriers' customers.

OneLink says it prices its software and services so carriers should be able to offer them to customers for $10 per month. US WEST charges $25 per month for the first 1,000 calls and 3 cents per call after that. ◪

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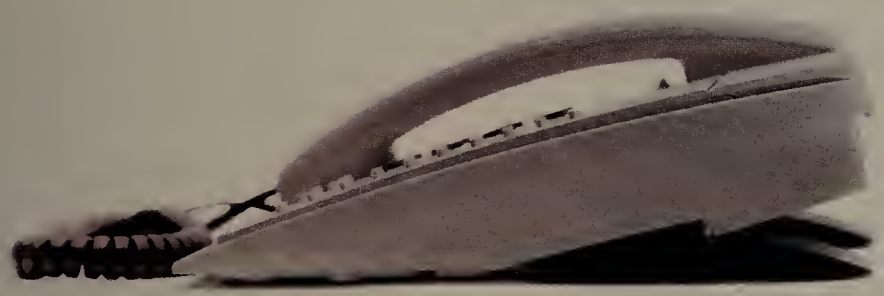

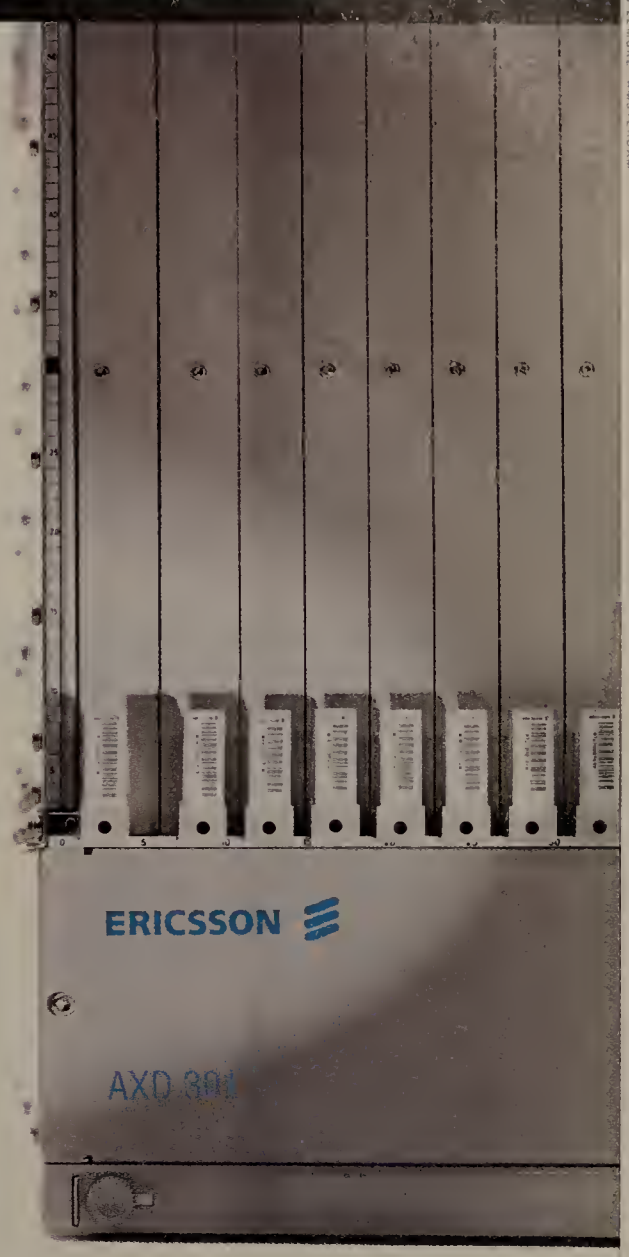

How often do the phones crash? (Still think your datacom is reliable?)

When it comes to mission critical services, Ericsson has been developing and implementing carrier-class switching systems longer than anyone. It's this experience we're now bringing to bear on datacom – in the shape of a new high-performance ATM switch.

You'll be hard pressed to find a more reliable switch than the AXD 301. With full system redundancy and in-service upgrade and expansion, your network will simply not go down.

It's also the most scalable ATM switch around – the AXD 301 is designed to scale from 10 Gbps to 160 Gbps. You can standardize all your switching needs on one system – from the massive core switch to the smallest node. With the AXD 301 you 'pay as you grow'.

And naturally it comes with complete ATM functionality, voice capability and a smart way to run IP traffic, making it ideal for the latest multi-service networks.

Which all goes to explain why, when large carriers pick up the phone to order large ATM networks, they're now calling Ericsson.

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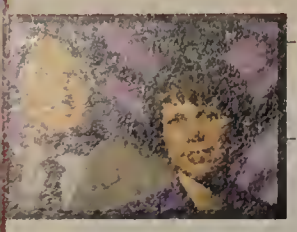

Wan Monitor . Daniel Briere and Christine Heckart

THE NEW RBOCs: IT'S ALL ABOUT PANTYHOSE

Well, we think it's time to officially call a timeout in all this merger mania. We're not getting the widespread innovation promised by the telecom act or the competition promised by all the new technology. Instead, the focus is on which products to merge, which ones to cancel and which employees to fire/keep/move.

We've been hit hard on this lately at TeleChoice because we have not been able to get the basics from our carriers. We cannot get ISDN or digital subscriber line (DSL) at our Denver office, despite the fact both are advertised heavily in the area. We cannot get any form of high-speed Internet access at our Connecticut offices where the new SBC Communications/Southern New England Telephone (SNET) combination is supposed to reign king. We figure SBC is too busy gobbling up other regional Bell operating companies.

You'd think the rollup of RBOCs into SBC would be a good thing, trimming costs and letting more money go to innovation. We just have to give it time, right? No. In fact, the conservatism of SBC is being felt across the SBC extended family, where all sorts of projects are seemingly on hold while employees wait to find what's going to happen when this or that merger is complete.

SBC claims to be data-savvy, but there is no innovation — just repackaged 2-year-old thinking. This is the company that talks about how much it is investing in opening its markets, while behind the scenes the carrier spends considerable resources making it difficult for new competitors to enter its markets.

And what we do hear about major initiatives within SBC does not really thrill us. We have many friends at Ameritech. The big news there? No, it's not a brand-new strategy, new products or even new management. No, it's that people can't dress casually anymore because SBC has a pantyhose and blue-suit approach (preferably not on the same person).

And then there's Bell Atlantic and GTE. That merger is still crawling. What's on everyone's minds at GTE? Thank goodness the shareholder vote passed because everyone can execute their options.

So what would we like to see? Simple: Stop all this expansion, and just give us what you are announcing. When SBC launched its Online Office — a single pack of e-mail, high-speed Internet, Web hosting, remote access and desktop support — we said, "Hey, neat." Of course, now we have to move to San Francisco, Los Angeles or Austin, Texas. You see, it's not being rolled out everywhere in SBC territory until later this year, and even then it's tied to DSL access availability. Oh no, here we go again.

You know, everyone complains about the Microsoft monopoly, but secretly, we all love that monopoly because we can count on a certain degree of uniformity across our applications and interfaces. RBOCs need to get away from their focus on out-of-region expansion, stock prices and merger mania, and start improving services in their own territories.

Briere is president and Heckart is vice president of TeleChoice, a consultancy in Boston. They can be reached at dbriere@telechoice.com and checkart @telechoice.com.

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Service-level guarantees meet the 'Net

BY DENISE PAPPALARDO

No matter what line of business your company is in, if it is planning to use the Internet to support employees, customers or business partners, then service-level agreements (SLA) are going to become increasingly relevant.

Getting an SLA from a phone company is one thing, but getting one from an ISP is another. Because the Internet isn't as predictable as, say, a frame relay network with fixed end points, it is far more difficult to get meaningful performance guarantees from an ISP.

But network predictability is exactly what companies need to have before putting their most important applications on the 'Net.

"In many ways, e-mail is the lifeblood of our organization's communications," says Joshua Norrid, directory of application development at Bristol Hotels and Resorts in Addison, Texas. "If our remote people can't access the network, then productivity is reduced," he says.

SLAs are intended for companies like Bristol. Typically, the agreements spell out the level of network performance a service provider will guarantee as well as the penalties the service provider will be forced to pay if it doesn't live up to its commitments. These penalties can include credits on your monthly service bill.

SERVICE-LEVEL AGREEMENTS

Users say SLAs are the way to go when dealing with ISPs.

JIM DANIELS

"I'm seeing a lot of SLAs written around a lot of fluff in regards to performance metrics."

Gary Rohs, manager of data communications, Sappifine Papers

100% guaranteed

Today UUNET, MCI WorldCom's ISP division, is leading the SLA pack with guarantees of 100% network availability and maximum round-trip latency of 85 msec over its domestic network. UUNET's international customers get the 100% availability guarantee and a maximum round-trip latency of 120 msec.

However, Bristol has chosen to work with GTE Internetworking, an ISP that is customizing its SLAs to meet the hospitality firm's needs.

Bristol is using GTE's dial-up Internet access, dedicated T-1 Internet access and managed firewall services — each of which has its own SLA. For example, GTE credits Bristol's dial-up accounts whenever the dial-up network is unavailable for an extended period.

In working with Bristol in recent months, GTE has had to do a lot of network re-engineering to meet Bristol's needs, Norrid says. Initially, "GTE didn't effectively communicate what was happening, when it was happening or where," he says.

So Bristol added a provision to its SLA that requires GTE to notify Bristol prior to any scheduled outage, Norrid says. GTE is required to inform Bristol of what areas of the country will be affected and for how long, he says.

Bristol also has a network availability guarantee from GTE for dedicated T-1 Internet access services. Norrid says the SLA is fine for the time being, given that his company is not using the service for mission-critical traffic. But Bristol will need better guarantees once that changes, he says.

The company plans to move its payroll application to the Internet so all offices can access the application from encrypted dial-up or dedicated Internet access connections. But before the company brings payroll online, Norrid says GTE will need to show that it has a redundant network.

Bristol also subscribes to GTE's Site Patrol managed firewall service, which comes with its own set of guarantees. "If there is an intrusion, GTE is responsible for shutting down our site immediately," Norrid says. Then Bristol engineers work directly with GTE's network operations staff to determine how the break-in happened.

Custom-tailored SLAs

Norrid's top SLA tip for other IS professionals: Be sure your service provider understands your business. That's the only way a service provider will be able to shape SLAs to meet your needs, Norrid says.

Embarcadero Systems, a large container shipping company in San Francisco, is another firm paying close attention to SLAs.

The company is launching an application that will let its customers track the status of cargo shipments via the Web.

"It's similar to what Federal Express offers its customers but for much larger shipments," says John Montgomery, an IS executive at Embarcadero.

Embarcadero is in the process of migrating from a local ISP to Sprint and is making sure Sprint is clear on required service levels from the beginning.

"We have certain bandwidth requirements and need minimum latency guarantees," Montgomery explains.

Embarcadero is negotiating to have Sprint provide monitoring tools that will let Montgomery track usage, network availability and throughput, he says. Embarcadero will use the tools to help ensure that Sprint is meeting its performance guarantees.

While service providers can be convinced to offer solid SLAs, the onus is still largely on users to hold carriers to those agreements, says Gary Rohs, manager of data communications at Sappifine Papers in Portland, Maine.

"I'm seeing a lot of SLAs written around a lot of fluff in regard to performance metrics," Rohs says.

Sappifine recently switched from AT&T Global Network (formerly IBM Global Network) to UUNET, and the paper manufacturer company has been satisfied with UUNET's guarantees.

"We're getting weekly statistics, we know what our throughput is and UUNET has been upfront with that type of information," Rohs says. "What we will be looking at is historical uptime, throughput, things that show us [UUNET] has good network management practices in place."

Such statistics will play a key role in how Sappifine expands its Internet application rollout beyond e-mail and basic Web access, Rohs says. ◩

Holding up your end

If your company has a service-level agreement from an ISP and you experience a service outage, it is important to quickly file a claim that contains the following details:

- Organization name and affected site name.
- Administrative contact's name and contact information.
- Date and beginning/end time of outage.
- Source and destination IP addresses or DNS site names.
- A trace route from the source address to the destination address.

SOURCE IDC, FRAMINGHAM, MASS

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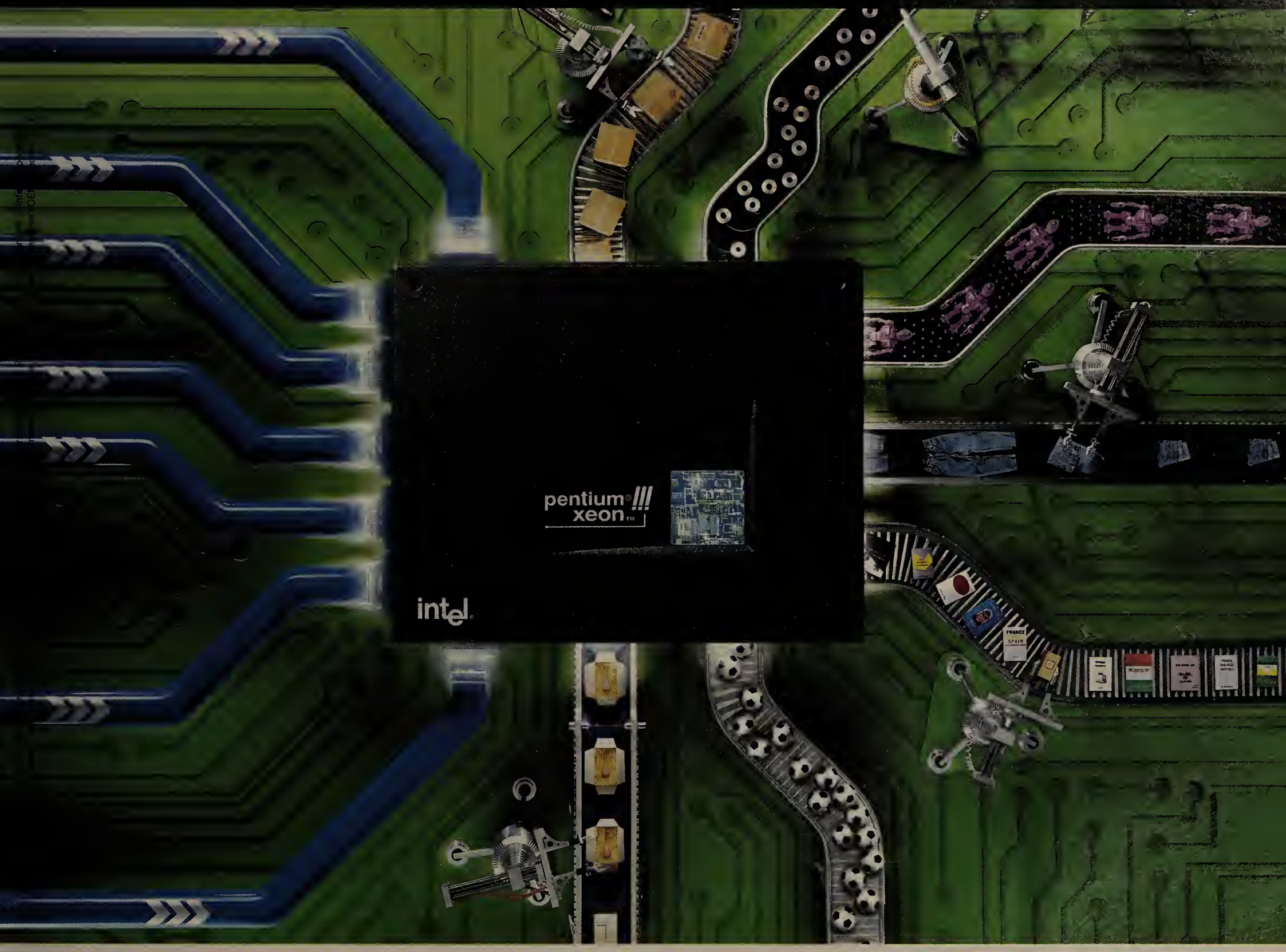

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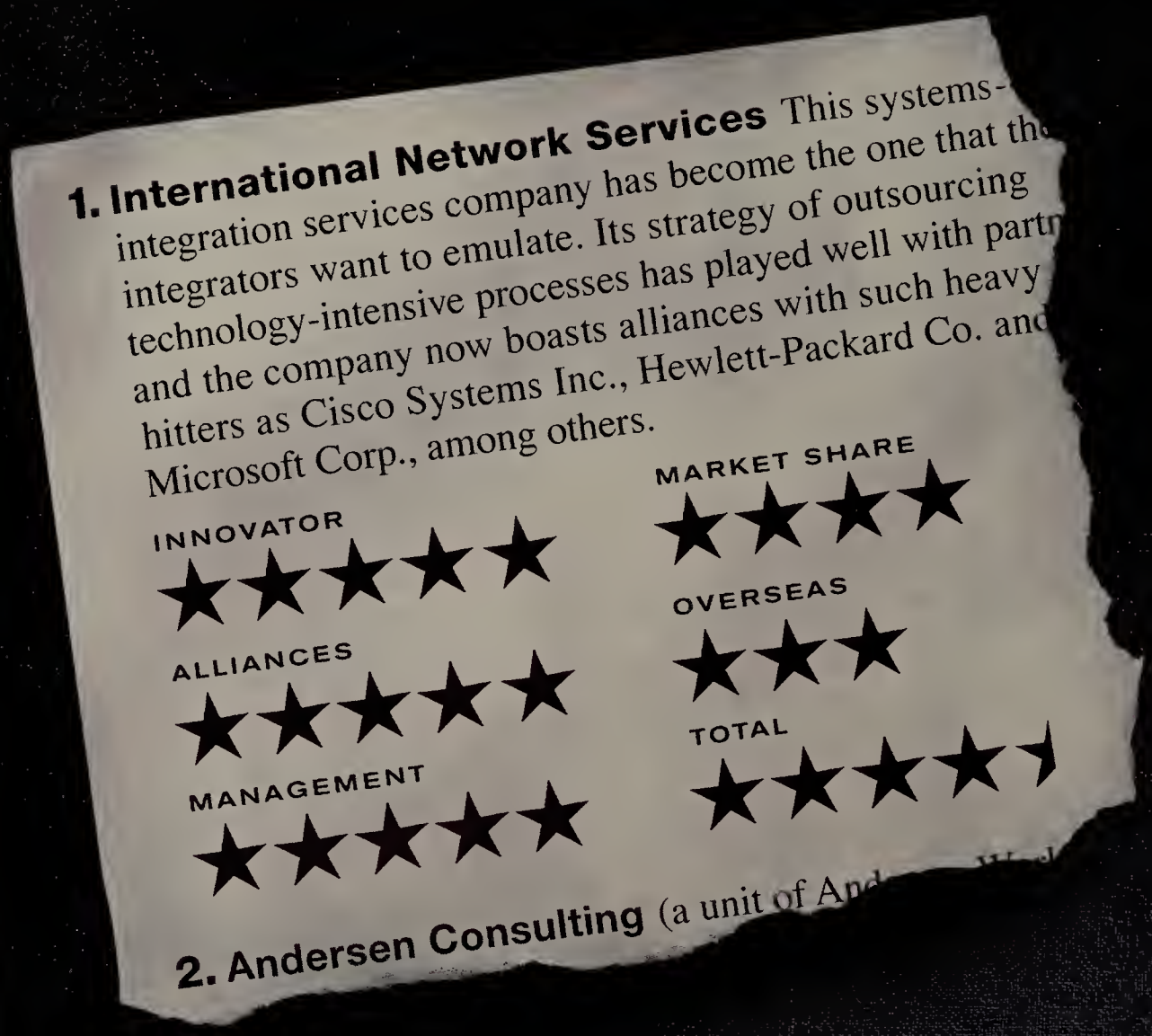

–Yankee Group/Upside Magazine, FEBRUARY 1999

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INS

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Briefs

Trilogy Software next month will ship Buying Chain Enterprise Edition. This NT server software lets employees within an intranet buy from electronic catalogs, which can be hosted by the suppliers outside the intranet. Corporate buyers are treated to their own view of the catalog's products and pricing through a special Buying Chain scripting module.

Buying Chain Enterprise Edition sends completed purchase order data directly into SAP AG or PeopleSoft applications, if needed. Buying Chain Enterprise Edition costs between $1,000 and $120,000, depending on configuration.

Trilogy: (512) 425-3100

DICA Technologies last week introduced a line of ISDN encryptors that can encrypt data end-to-end on a B-channel basis. The DICA 7800 BRI Encryptor, which starts at $1,900, scrambles data sent over a Basic Rate Interface line. The DICA 9000 PRI Encryptor, which costs $6,000, works on Primary Rate ISDN networks.

DICA: (401) 683-6100

From the man who created the **Amiga** operating system comes **Rebol 2.0**, the most recent version of a messaging language designed to handle communications over the Internet.

Released by Rebol Technologies, Rebol 2.0 is a platform-independent programming language designed to perform tasks such as automated Web page retrieval and e-mail processing. It was created by Carl Sassenrath, now CEO and founder of Rebol Technologies and creator of the Amiga operating system.

Rebol can be downloaded free at www.rebol.com. Rebol 2.0 will also be bundled with Red Hat Software Linux 5.2.

Rebol: (707) 467-8000

IN-SITE: *Lessons from Leading Users*

Company sends paper packing, speeds up service

BY JOHN COX

Brand ID LLC, which arranges the sales of millions of buttons, logos and labels to clothing companies, used to be in the dark ages when it came to transactions. The outfit based its work on spreadsheet printouts — which led to an endless cycle of faxes to and from its customers. In the end, transactions could take up to a week and a half to complete.

Now, in some cases, transactions take place in a day.

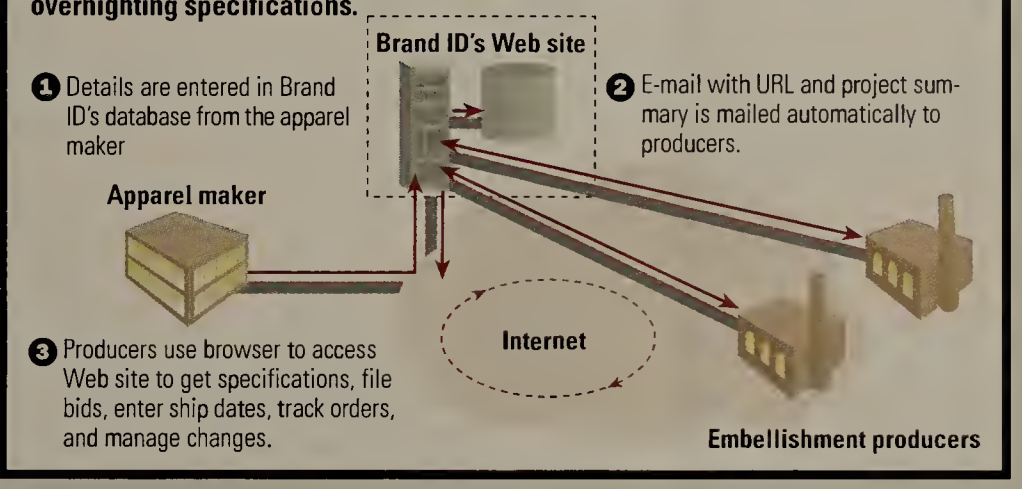
What sped up the service? A Web system with a heavy reliance on Microsoft software, that's what. The buttons, logos and so forth are called embellishments in the business, and Brand ID acts as a broker for a lot of them so clothing manufacturers can put the finishing touches on shirts, jogging suits and jackets.

"It's not as simple as ordering a book from barnes&noble.com," says Brand ID co-founder Colin Cormac. "We're talking about millions of items in multiple shipments that have to be redistributed. And we have to track all of this."

Managers realized the paper system was causing communications problems and errors, which threatened the company's growth. They turned to Cotelligent, a San Francisco integrator specializing in Microsoft products, for help. In about five months, Cotelligent built a Web site running Microsoft Internet Information Server and Microsoft Transaction Server. The site is tied into a Microsoft SQL Server 6.5 database running on a separate server.

Web speeds order management

Brand ID LLC acts as a middleman between apparel makers and companies that produce the sewn-in labels, paper tags, buttons, decorations and printed images for new shirts and jackets. A multitiered Microsoft-based application, accessed by the Web, replaced a cumbersome manual process of faxing spreadsheets and overnighting specifications.



Now Brand ID sales representatives simply call up a PC application written in Visual Basic and enter initial data from the clothing maker: items needed, specifications, dates and so on. Brand ID product managers review the data and request bids from select embellishment manufacturers. SQL Server automatically sends an e-mail to the suppliers, including a summary of the project and a URL on the Brand ID Web site that points to more complete details.

Staff at the subcontractors use a browser to access the data, submit quotes, enter shipment dates and other information. The clothing maker and Brand ID review the quotes and select the subcontractors. The system generates the purchase order.

"All this could have taken a week and a half before," Cormac says. "Now it can be done in one day [in some cases].

"We're the last link in the chain before the goods get to the retail stores," he says. "It's very, very important if we can cut down even one day in that delivery process."

Brand ID's active customer base has grown 100% in the past year. Cormac estimates that about 50% of that increase is directly attributable to the new Web system. A year ago, sales representatives could manage about 10 customer accounts at a time. The new system lets sales representatives manage 15 to 25 accounts.

This year, Cormac expects sales to grow 15% just on the basis of the new efficiencies, and another 20% based on picking up new customers as a result of Brand ID's new transaction capabilities. ◪

More management on the cheap

Eight network and systems mgmt. tools that are free (or close to it).

BY JEFF CARUSO

Many network managers remain unaware of the range of free tools available to help them do their jobs.

It's easy to see why. Net managers are bombarded with marketing messages from powerful management software companies that want to sell expensive and complex management systems, while the makers of free tools rely mainly on word of mouth.

The downsides of using public-domain tools are that support may be thin, and because the source code is out

See **Management**, page 42

Microsoft sets sites on interactive HTML documents

BY JOHN FONTANA

Microsoft recently put some meat on its Office 2000 collaboration plan by unveiling a new tool for creating interactive HTML documents.

Vizaet 2000, an add-on to Offiee 2000, brings interactive capabilitics, such as text that appears and disappears with the movement of the mousc, to existing HTML documents. The application ean also ereate documents.

With Vizact, users ean create thesc interactive documents without the need for special scripting or eoding.

Vizaet uses the existing Office installer familiar to many network administrators and can be managed much like Offiee. Administrators won't have to deploy server extensions to support Vizact, and they can deploy the add-on from the desktop or Windows Terminal Server. Documents can go on a Web server or file server or be e-mailed stand-alone.

One of the application's highlights is a feature called Interactive Bullets. The bullets act like hyperlinks that reveal additional text when highlighted with the mouse. But unlikc traditional Web-based hyperlinks, the additional text is actually embedded in the document and is not a separate HTML page that must be retrieved from a server.

"By using the bullets we can highlight more information on a single screen on our Web page," says Bill Berg, president of CoolWorks, an online site that recruits seasonal workers. Berg says having a single document means users don't have to wander through multiplc Web pages — potentially getting lost in the process.

But one drawback is that you can "end up with some pretty beefy documents," Berg says. He has not deployed Vizact pages on his Web site because of this reason, and also because they require Internet Explorer 5.0. That browser is the only one that supports a specification called HTML+Time that Microsoft, MacroMedia and Compaq submitted to the World Wide Web Consortium (W3C) in November 1998. The specification is currently making its way through a W3C working group. Microsoft is using HTML+Time and Extensible Markup Language on the back end to create the tags that support interactivity.

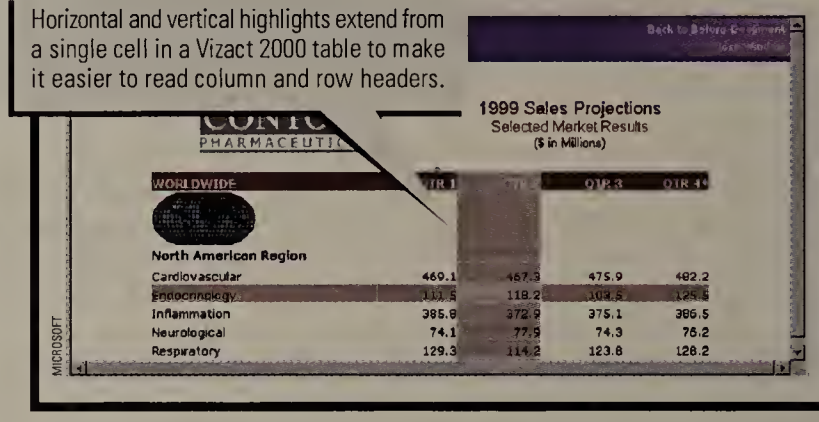
Another Vizact feature is Table Highlights, which makes it easier to read the headers on rows and columns by highlighting them when the mouse passes over a cell in a table. Vizact also has a series of document template wizards and a host of so-called Effects that trigger moving text or text and picture animation.

A preview of the application is available on Microsoft's Web site at www.microsoft.com/vizact. The software is expected to ship this summer and is priced at $149. ◪

Table manners

Microsoft last week unveiled its newest productivity application for its Office product line. Although it won't ship with Office, Vizact 2000 fits into the collaboration plan of Office 2000.

Horizontal and vertical highlights extend from a single cell in a Vizact 2000 table to make it easier to read column and row headers.



Management,
continued from page 41

in the open, the software could be vulnerable to haeker attacks, says Steven Maxwell, a development manager at Federal Express and author of *Unix Network Management Tools*.

Some folks with public-domain backgrounds are realizing there's money to be made, but the prices of their products are still low. Such is the case with Tripwire, a public-domain seeurity produet that's being commercialized by Tripwire Seeurity Systems. The product costs $495. "But I think that's not a big issue, compared to the benefits you get," Maxwell says.

When *Network World* ran its first story on inexpensive management software last month, we knew we were only scratching the surface (*NW,* May 10, page 51). We rceeived a lot of eneouraging feedback from our readers. It would be a shame to keep this information to ourselves, so here are eight more free or very inexpensive management tools, reeommended by your peers.

Big Brother

Big Brother is a systems monitoring tool. Using scripts on remote servers, it looks at disk space, CPU usage and services (such as e-mail). The scripts send information about the status of their systems and services to a central location, where the status is displayed with a color code. Managers can access the display through a Web interface and click on the colored dots to get more detailed information on a particular system. Big Brother's Web site has several links that demonstrate how organizations are using the software.

Cheops

Cheops is described on its Web site as "the network equivalent of a Swiss army knife." It maps a network and shows what operating systems and services are running on hosts. Cheops draws on techniques used in tools mentioned in our last article. For instance, it uses QueSO for detecting operating systems and trace-route-like methods for mapping out the network. Future versions are expected to include monitoring, as well.

EPAN

EPAN is a protoeol analyzer that can generate traffic statistics. Gathering data from probes, it can show utilization rates or which protocols are generating the most traffic. EPAN ean also capture Ethernet frames like a traditional protocol analyzer. It runs on several versions of Unix, and it supports TCP/IP, IPX, NetBIOS, DECnet, Banyan VINES and other protocols.

Ethereal

Ethereal is a protoeol analyzer that runs on Unix. It captures data from a network connection or reads data from a file created by tcpdump. Managers can use the software to filter out packets and look for specific transactions. The software is still new, and its Web site notes: "Ethereal has enough functionality to be useful, but it's far from complete."

Netperf

Netperf is a tool for benchmarking. The software ean measure throughput in one direction and end-to-end latency. It can also measure performance for TCP, UDP and other protocols.

Originally developed by Hewlett-Packard, Netperf is now distributed free.

Ntop

Ntop shows network usage. It displays what hosts are connected to the network and which are the top talkers. It can sort traffic based on protocol type, source, destination and other criteria. Unix and Win32 versions are available.

SolarWinds IP Network Browser

The IP Network Browser discovers and maps a network. It sees which devices are responding and queries them using SNMP. It gathers information from routers and servers about their network interfaces, routes, services and other data. This tool isn't free, but the license is only $75 per machine. SolarWinds also sells other network management tools.

Tripwire

Tripwire, acting as an intrusion detector, determines if any protected files have been altered. Administrators tell the software what kinds of activity to watch for. Tripwire reports on unauthorized changes and can send an e-mail message to an administrator when certain violations occur. The tool is available on Unix and Windows NT. ◪

Where to get the tools

Go to these URLs for more information and to download the tools.

Tool	More information	Download
Big Brother	http://maclawran.ca/bb-dnld/new-info.html	http://maclawran.ca/bb-dnld/new-dnld.html
Cheops	http://www.marko.net/cheops/	ftp://ftp.marko.net/pub/cheops
EPAN	http://www.et-inf.fho-emden.de/~tobias/epan/	ftp://fbti.et-inf.fho-emden.de/pub/epan
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Netperf	http://www.netperf.org/netperf/NetperfPage.html	http://www.netperf.org/netperf/DownloadNetperf.html
Ntop	http://www.wilmcd.com/ntop/	ftp://ftp.wilmcd.com/pub/ntop/
SolarWinds IP Network Browser	http://solarwinds.net/IP%20Network%20Browser/default.htm	http://solarwinds.net/Updates.htm#IP Network Browser (purchase)
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The Scoop
The news behind the news

HOW CDSA TIES SECURITY TOGETHER

There are a lot of encryption and authentication products available from various vendors — everything from public keys to digital certificates to cryptographic processors in hardware — and more.

The problem is getting products to work together in the same network and having them adhere to the same encryption and authentication policies.

Enter The Open Group's software framework, the Common Data Security Architecture (CDSA). If enough vendors support this standard, interoperability between various security tools will be greatly increased, proponents say.

CDSA, now in its second revision, seeks to promote interoperability in encryption and public-key products through common APIs for X.509 digital certificates, the Digital Signature Algorithm and Lightweight Directory Access Protocol.

CDSA in short

CDSA lets users exploit a variety of security tools in their networks. The architecture encompasses these elements:

- Trust policies
- Data storage library
- Cryptographic service
- Certificate library
- Key management and retrieval

Products built to the CDSA specification will have a unified method of executing encryption and digital signature functions, as well as a common way of handling digital certificate lookup, storage and retrieval, proponents say. CDSA code is embedded in the vendor's applications, operating systems or as a stand-alone run-time code in clients or servers.

Key recovery an issue

IBM pushed to have an optional key-recovery mechanism added to CDSA with the hopes that this would placate the U.S. government and other countries that object to the use of strong encryption. A key-recovery mechanism lets a corporation or third party gain access to encrypted data without the user surrendering his private key.

A number of vendors, such as Compaq and Motorola, have signed on to CDSA. IBM's SecureWay unit also intends to gradually implement the framework across its product lines, says Jeff Jaffe, the unit's general manager.

Some companies that signed on to the standard, such as IBM, have already made product announcements. IBM's SecureWay recently released KeyWorks, a CDSA-based tool kit that allows users to recover lost or damaged encryption keys. KeyWorks runs on OS/390, AIX, Windows NT and Solaris; IBM is also considering using CDSA for other products, such as MQSeries, its application messaging middleware.

Compaq also recently announced plans to start embedding CDSA APIs into its Tru64 Unix operating system, which will let users select a variety of public-key suppliers, Compaq claims.

— Marc Songini

Network World Senior Editor Ellen Messmer contributed to this story.

PKI: The good, the bad and the ugly

Public-key infrastructure (PKI) is beginning to get a lot of attention. But just how good is this new technology, and what can vendors do to make it better? To find out, Network World *recently assembled a who's who of PKI vendors and consultants to kick around the issues. Participants included Vijay Ahuja, a consultant with Ernst & Young; Gina Jorasch, director of evangelism for VeriSign; Michael Rothman, executive vice president of SHYM Technology; Christopher Voice, a product manager for Entrust; Paul Paget Jr., a vice president of CyberTrust, a division of GTE Internetworking; and Andrew Morbitzer, director of marketing at Baltimore, Inc.*

Ernst & Young's Ahuja wants complete solutions and interoperability.

What is the state of security today?

VeriSign's Jorasch: I think the state of technology of securities is quite far along; there are plenty of solutions out there that will solve your problem for your intranet, your extranet or electronic commerce. The main issues, right now, are: Is PKI as easy to use as companies would like? Is it as interoperable across all the different application areas as they would like to see?

VeriSign's Jorasch predicts a shift to the real-time nature of security.

From a vendor's perspective, we think PKI is ready for prime time, and we see plenty of customers who are having great success adopting PKI and enabling secure commerce and secure extranets. We think the momentum is building for more to do that.

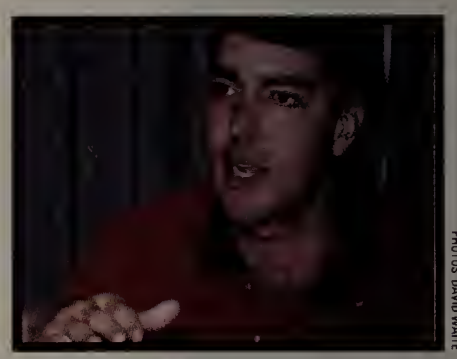
Ernst & Young's Ahuja: From, say, the mid-to-late 1980s to early 1990s, there was this big pressure on developing security inside the network, such as passwords and access control, and I think it went pretty well. But there was this constant, lingering struggle for the security manager to justify the importance to the financial officers and the CEO. It was almost like it was an expense site investment with no returns.

Today I think the technologies are really great. And what we need is to provide complete solutions. To me, a complete solution is that if I'm an end user or I'm a client application, I should have all the security services in a way that they are hidden from me, that I do not have to know them, but they provide me complete security.

Baltimore's Morbitzer: When I'm in meetings, for the last six or eight months, I'm not just dealing with the technology person. I'm in there now with a business operations owner, a business applications owner or a business services owner, who's saying to me: 'Show me the business case.'

VeriSign's Jorasch: We have a customer who I think illustrates the change, in that their business unit actually had bonuses that were tied to whether or not they got this security extranet out within a particular time frame, which they did, which we were pleased to see. But it just shows how much more the value proposition is driving the extranet, how much more it is mission-critical and tied to the core business. This was a marketing group that had revenue riding on getting this extranet out, and I think that is new for security. It used to be infrastructure, it used to be boring, and now people's jobs are on the line to get things out there, to be competitive and to beat their competitors in the marketplace.

Ernst & Young's Ahuja: Let me bring to the surface some of the issues I think we are facing with this technology. One of them is completeness of the solution. In the particular case of digital certificates, we have the vendors creating the digital certificates, but it's almost like going and telling a chief information officer, 'Hey, listen, you've got to spend the money, but I can't tell you, in your language, what I'll do with digital certificates because I can't relate with you. Here are digital certificates but, by the way, to do security means you've got to do another three things.'



PHOTOS: DAVID WAITE

Baltimore's Morbitzer claims PKI open standards are working.

Do we have complete turnkey solutions, so customers will feel comfortable that they're not tied down with a certain vendor?

Baltimore's Morbitzer: I think we've got something, particularly in terms of PKI, that this group seems to be very supportive of. We've talked about open standards and IT for a very long time, and a ton of them have fallen on their face. We can go across mail initiatives, X.400, we can go across directory initiatives — all sorts of things that you look at are falling apart. And yet we're finding open standards working here.

We actually can look at applications that sit on the client and applications that sit

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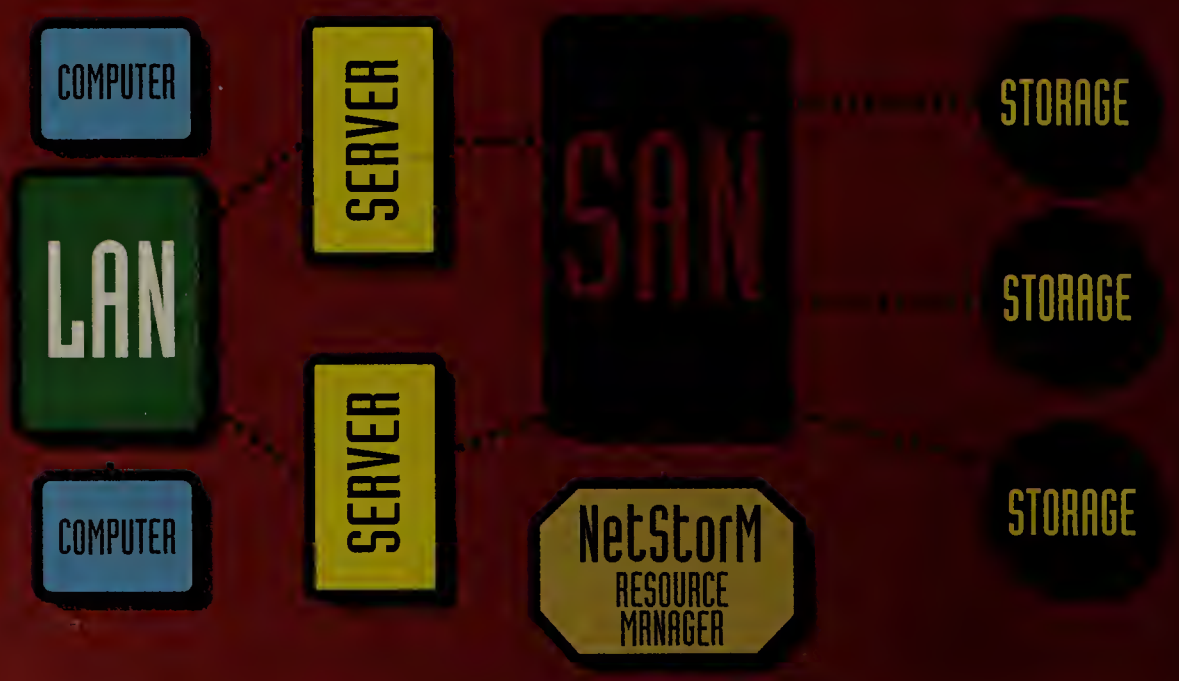

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continued from page 44

in the server. We can test, literally in a matter of minutes, over the Internet to make sure that a server that eustomers want to use, a elient they want to use, can work with our PKI.

So where do we stand with compatibility?

SHYM's Rothman: Let's use PKIX as an example. There are two variants of PKIX.

The way Entrust implements X.509 V3 is different than the way VeriSign implements X.509 V3. So what we've done is we've standardized termin-

PHOTOS: DAVID WAITE

Entrust's Voice: "Standards don't mean bubkes unless there's testing behind them."

ology. We have not standardized technology.

I'm not disputing the faet that people are trying. But I see standards as a tool that vendors use time and time again as a base platform, and then they differentiate the hell out of them to try and gain a leg up in the market.

Entrust's Voice: Standards don't mean bubkes unless there's testing behind them. We have a very big advantage in that we have a eommon forum that most of us are turning to, which is PKIX, to provide testing. And sure, we're going to have variations, but that's always going to be the case. We need to get these things together and test, that's the only way we're going to solve interoperability problems. But I'm not sure we're that far apart. I mean, I'm sure there are different flavors, and ultimately we'll have to support a eouple of different flavors.

Ernst & Young's Ahuja: Well, it's probably OK, but let me just put something in front of you. I'm a eustomer, I buy one of the PKI solutions, and I write my applieations to use the eertifieates. Three months later I change to another vendor. You think I'll be able to do it without telling my applications developers?

Baltimore's Morbitzer: I think you can build applications today that move between vendors, and I'll tell you, some people have done it. Outlook Express works with all our produets. Netscape Communicator works with all our products. And there is a tool kit that Baltimore sells, for example, ealled PKI Plus. Something written with that works great with VeriSign. And we've had people use that took kit who never buy our PKI, and they run it with all the different flavors of PKI that are in the room.

Now you can go further, and you ean eertainly eustomize, whieh is what gives all the different vendors a competitive edge as we come out with new releases of produets. But depending on what you do, you can write PKI-neutral applieations.

Ernst & Young's Ahuja: Yeah, I guess I'll give you that in some eases you are able to do it.

We all know that there is not full interoperability. Do the formats mateh? Suppose Entrust has a produet, and I'll name one, let's say Express or whatever. Could I use VeriSign eertificates to run that application?

VeriSign's Jorasch: Absolutely, you ean do that.

How is the security threat changing?

Entrust's Voice: Our customers' statistics are showing that the biggest threat is coming from inside, where hackers can do a lot more damage. They have access to more high-value transactions and operations.

With the hackers, it's definitely a great public relations thing for us all. There's the image of the guy in the black cape and stuff, but the reality is that most of the threat from these guys is coming from inside.

VeriSign's Jorasch: And there's a whole other threat, which is the denial-of-service threat. As you depend more and more on your extranet and e-commerce, you want to make sure you can guard against that sort of threat as well.

Baltimore's Morbitzer: Identification is something we've all talked about — proofing the individual or the services getting a certificate. That's old news. Moving forward, we will be starting to offer options, in addition to what you're doing with certificates today. These will protect your applications and your business data [and are what I call] attribute certificates.

The idea is to start using certificates, even down to your devices. How many of us here have 10 devices that we could easily name that could use a certificate to enable something that we do? So there are actually going to be more devices that pick up the service than individuals. At some point in the 18- to 24-month future, that's where the turn will happen.

VeriSign's Jorasch: I think another big change that we're going to see in security is the real-time nature of security. When it is just internal, somebody gets fired, you've got maybe a couple of hours, maybe a day, whatever it is, where you can alleviate that security threat.

SHYM's Rothman: Everybody's

SHYM's Rothman: "What we've done is we've standardized terminology. We have not standardized technology."

looking at it wrong. Let me push that one step further. I don't think there's an inside or an outside three years from now. There's no intranet or extranet or big 'I' Internet, over time. There is just the interconnected network, whether it's based upon a web of trust or something. Because when you think about the applications that customers want to put in place, they can't do this artificial separation of, 'Let me take a subset of my data and set it out in this mythological extranet,' and that's stuff that I feel comfortable that could possibly be compromised.

In order to move to a real-time world where you've got real-time optimized supply chains, the true virtual organization, the only way that works is if you're dealing off one centralized point of data for every specific businesses out there. You can't play favorites between an internal person on the shop floor vs. a trading partner or a retail partner that's worried about where their palette of Pampers are.

The point is, we've got to build an infrastructure that may be put in place because of an extranet requirement. But if this does not map as cleanly and to the big "I" Internet from an application perspective, all of this stuff is for naught.

'Net Insider . Scott Bradner

BLOCKING DATA FOR A GOOD CAUSE

When I get Internet service, I want full Internet service — but that's not what you get from some ISPs.

Some providers block or control their customers' abilities to use some protocols. This has been a bone of contention for us Internet purists for quite a while. But in some cases, blocking might just be reasonable.

One of the things that made the Internet what it is today is the freedom 'Net users have to experiment. With the Internet, most applications are run on a user's own computer. If you and I want to create an application and run it over the Internet, we can do just that. We do not need permission from ISPs, a government agency or phone company. Any blocking of data flows by ISPs limits this freedom.

But some ISPs insist on blocking some types of data. One thing many cable TV-based ISPs block is the set of protocols used by Windows for its "Net Neighborhood" feature. This makes a lot of sense because if this traffic is not blocked, you can peer into your neighbor's computer. (As a Mac user, this does not affect me one way or the other.)

A particularly galling type of blockage is one in which an ISP limits the ability of a user to send e-mail. In such a case, the ISP sets up a filter that only lets the user send e-mail to the ISP's message server. This is frequently done in the name of preventing unsolicited bulk e-mail, otherwise known as spam.

The ISP programs its message server to refuse to forward e-mail that is being sent to thousands of destinations or limits the amount of mail that an individual can send per day. This limits one's ability to use that ISP to distribute spam.

This sounds like a socially responsible thing to do, but it can be a real danger. All of the user's mail has to go through a server that the user does not control and one that records to whom the mail is sent. In addition, a dishonest ISP employee has a very easy place to eavesdrop on the mail.

AT&T WorldNet seems to have a better idea. The ISP puts this type of messaging restriction on new accounts, but the restriction can be removed after the account has been in place for awhile.

The normal way that a spam artist works is he uses a free testing account, often with a false name and credit card information, to send a batch of spam. The spammer then never uses the account again.

AT&T's model can stop this practice. By restricting bulk mailings for a certain time, AT&T can collect the account billing information it needs to track down customers in case they send spam at a later time. This messaging restriction is one with which I can live.

Disclaimer: Harvard does not restrict most things, such as ego. But the above is my support for some restrictions.

Bradner is a consultant with Harvard University University's Information Systems. He can be reached at sob@harvard.edu.

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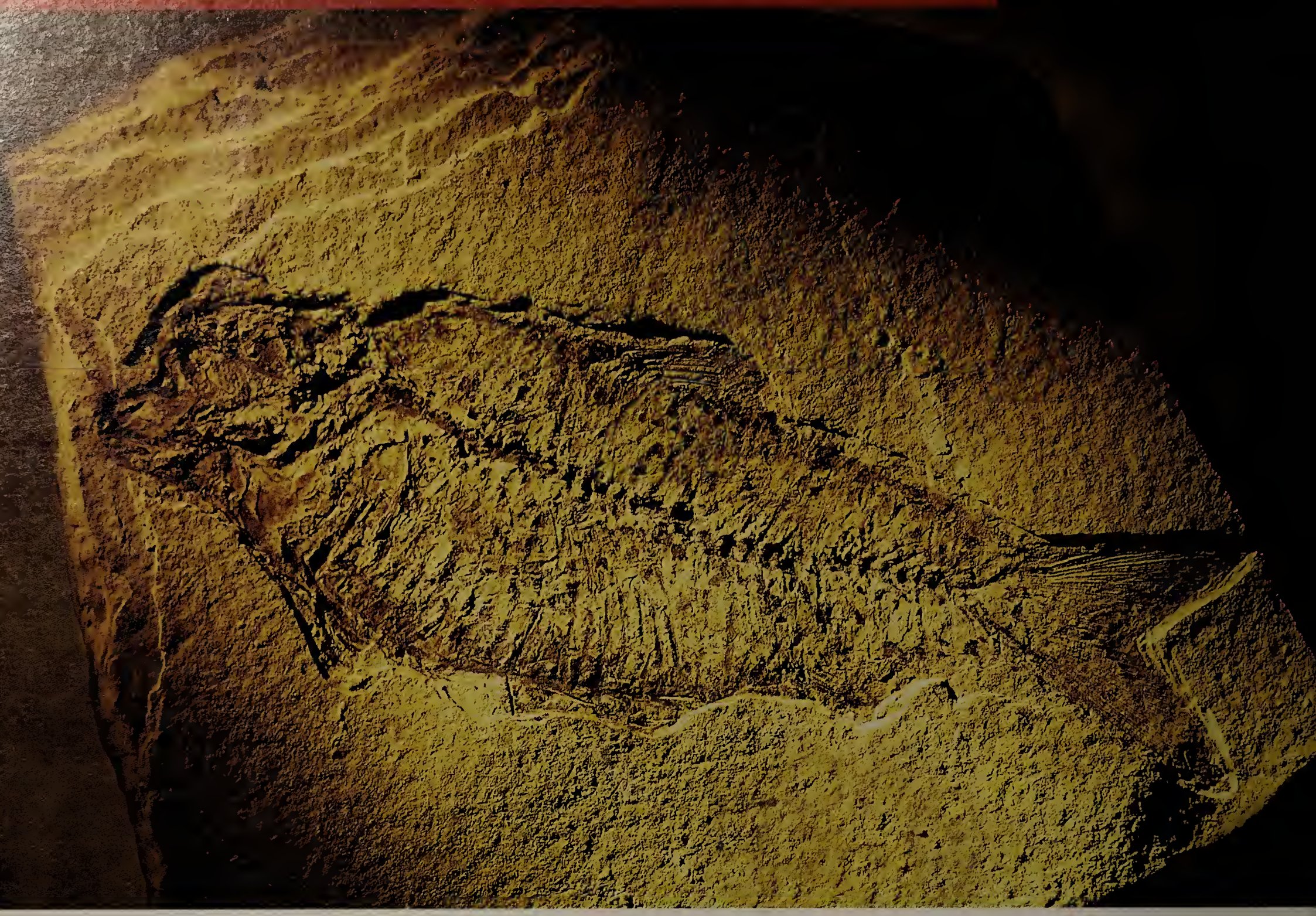

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Technology Update

An Inside Look at the Technologies and Standards Shaping Your Network

Ask Dr. Intranet

By Steve Blass

We're developing an intranet for our 55,000-plus employee organization. What is the best way to organize and standardize the folder and file structure for optimum maintenance? We don't want each department to become segregated.

Kevin Shoop, technical writer, HCR ManorCare, Toledo, Ohio

You didn't say whether responsibility for maintaining the Web pages is centralized or distributed, and that will make a difference in how much control you have over the implementation of a standardized folder and file structure. The trick is to implement standards that make sense (or are at least tolerable) to the people who have to use them.

One idea is to have each organizational entity use a common top-level layout so visitors from other departments find a familiar setting as they enter different intranet areas. Defining a common top-page layout and links to standard information items also will make navigation and maintenance easier.

Another idea is to generate Web pages from an institutional database that serves as the single repository for all intranet information. This can simplify Web page maintenance because all the data lives in a database management system instead of being spread out across static HTML pages.

However, automating all Web pages this way will take some upfront planning and design work.

As a network architect at Houston-based Sprint Paranet, Blass understands the strain of developing and managing intranets. Send your problems to dr.intranet@paranet.com.

Convergence? Try voice over frame

BY WILLIAM FLANAGAN

There's a sleeper technology that lets users mix any form of data with voice. It's FRF.11, the voice-over-frame-relay implementation specified in an agreement published by the Frame Relay Forum in 1998. FRF.11 is based on International Telecommunications Union and ANSI standards for frame formats, signaling and voice encoding. FRF.11's secret ingredient is a "subframe" format that can pack multiple sessions of voice or data in a single frame.

encoded. Smaller frame relay access devices (FRAD) and routers typically offer analog interfaces to phones and PBXs. The analog-to-digital conversion is done internally, by a coder/decoder. A CODEC first converts voice to pulse code modulation (PCM), the standard 64K bit/sec voice format of the public switched telephone network.

The most common frame relay service is on a 56K bit/sec access line. That's why voice FRADs usually compress the PCM bit stream. The compression algorithm, which runs on a digital signal processor

picture of what the sender does. It also conveys simple on-hook/off-hook status.

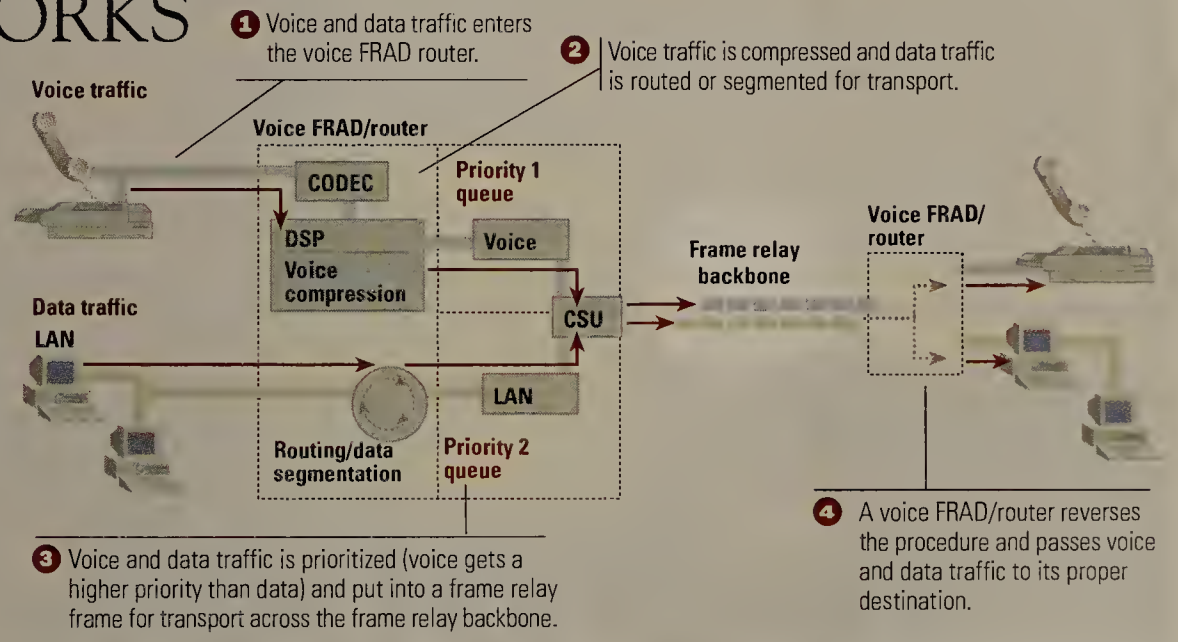
During a signaling event, such as dialing, the dialing end originates signaling subframes continuously, replacing voice with DTMF or dial-pulse packets. To protect against loss of frames, each interval of signaling information is sent in three consecutive subframes with overlapping content. Sending only voice or signaling (not both) prevents misinterpretation.

Fax transmission occurs in the same subframe format. Rather than apply voice coding to the fax modem noise, a voice

HOW IT WORKS

Voice over frame relay

Voice over frame relay, as defined in the Frame Relay Forum's FRF.11, is based on ITU and ANSI standards for frame formats, signaling and voice encoding. The technology's real benefit is that it defines a way to pack multiple sessions of any type — voice or data — within a single frame. Running voice over a frame relay network reduces the cost of a standard call, but also lets users better utilize existing frame nets.



A frame relay frame may contain multiple subframes from one conversation, single frames from multiple logical channels, or both. A subframe can be any digital stream — voice or data.

Consolidation of traffic on a single Data Link Connector Identifier — a frame relay virtual circuit number — eliminates the need for additional DLCIs. This simplifies the job of the backbone: the carrier configures only one frame relay virtual circuit, and the number of frames to process is cut dramatically. That's important because most switches reach their packet/second limit first, before bits/second top out.

On the downside, building larger frames from multiple subframes of one voice stream increases accumulation time and round-trip delay, potentially impairing voice quality. An alternative strategy is to send frames at short intervals, filling them with any subframes that are ready. This approach minimizes jitter at the source.

To transport voice, it must be digitally

(DSP) chip, largely determines the perceived quality of voice transmissions. Devices implementing FRF.11 call out the CELP (code-excited linear prediction) method defined by ITU recommendation G.729, which produces good voice quality.

Each voice path produces a separate stream of subframes. Each subframe is marked with its own channel identifier to indicate whether it is: part of a voice utterance; the last packet before the sender stops transmitting (to minimize bandwidth while the speaker pauses); fax; or signaling information.

Signaling is done in two ways: In dual-tone multifrequency (DTMF) transfers, the compression processor detects tone pairs and converts them to codes that indicate which button is pushed and when the tone starts and stops. With the second method, dial pulses, frequent sampling of a two-wire analog input detects switch closings/openings that define dial pulses. This signal mode captures a very precise

FRAD typically swaps its DSP software from voice compression to fax modem. The data going into the packets is the original data generated by the fax scanner before passing through the sending fax's modem. With 9600 bit/sec fax machines operating at full speed over frame relay, just over 10K bit/sec of bandwidth is used.

Data subframes contain segments of whatever protocol the terminal equipment sends to the FRAD. Subframe headers indicate the start, continuation and end of a data block. When mixing voice and data, the size of data subframes can be tuned to minimize jitter in voice packets when they have to wait behind data frames. Most FRF.11 voice implementations also prioritize voice over data.

Flanagan is program director for NetReference in Sterling, Va. He can be reached at flanagan@netreference.com.

Gearhead — inside the network machine . Mark Gibbs

Got a message? Join the queue

Microsoft Message Queue Server (MSMQ) has been appearing all over the Microsoft landscape during the past few months, but it is a technology that is not generally well understood.

Yet the technology is essentially very simple: It is a Windows NT subsystem that supports the asynchronous transfer of messages between a sender and receiver.

Why should this technology be of interest to you as an enterprise IT person? Simply because MSMQ can be used as a strategic foundation for a range of services and systems that are straightforward to implement and verge on mainframe-like robustness.

MSMQ is robust and reliable (within the limits of NT's reliability, an issue Gearhead may vent about some other time) and can be applied to generalized messaging, electronic commerce or any other multitiered application.

MSMQ supports priorities and reliable transfers, and, according to Microsoft, is scalable. Of course, we all know that the proof is in the pudding; very large MSMQ installations that handle messaging on the scale of, say, the Visa credit card network, aren't out there yet. That's what Gearhead thinks of as scalable, but we digress.

Underlying the product is the MSMQ Information Store, mercifully shortened to MQIS. This is a distributed database that stores information about MSMQ users, machines, queues and their properties, as well as about the network configuration. But MQIS doesn't store or manage the queues — queues are stored in protected subdirectories in the file system.

Note the term "distributed" — messages can be queued by a sending computer and routed across intermediate computers to reach the receiving computer.

There are three types of messages: Express, recoverable and transactional. Express messages are designed for fast transfer, but if the system fails, they can be lost. Recoverable messages don't suffer from the same limitation, but the overhead of ensuring transactional integrity reduces the message transfer rate. An issue with express and recoverable messages is that they can be duplicated. This means that the receiving application must be able to deal with copies.

Transactional messages add transactional integrity and uniqueness as well as support for updates to other resources. The cost is much reduced communications performance. Microsoft's MSMQ performance paper discusses this in detail.

Developers can build MSMQ applications using almost any language, including Java. See the resources below for an excellent text on programming MSMQ.

A downside is that MSMQ is Windows-specific and proprietary, but Microsoft did define a way to extend MSMQ to other messaging environments. This method is based on connector applications that bridge different standards. Companies such as Level 8 (www.level8.com/falconmq.htm) offer support for connections to messaging systems on IBM, Unisys and assorted Unix machines.

In fact, Microsoft has attracted a raft of third-party vendors to support MSMQ management, extension and consulting services so organizations considering message queuing can find all of the support needed for large-scale deployment.

Resources:

- Microsoft Message Queuing Overview and Resources: www.microsoft.com/ntserver/appservice/exec/overview/MSMQ_Overview.asp
- Microsoft's paper on MSMQ performance: www.microsoft.com/ntserver/appservice/deployment/planguide/msmqperformance.asp
- Microsoft's MSMQ partners: www.microsoft.com/ntserver/appservice/exec/vendors/MSMQ_Partners.asp

Queue your messages to gh@gibbs.com. Oh, and take the Gearhead survey: Send a message to survey.gh@gibbs.com.

Network World Fusion

Spotlight

News, tips and tools from our Web site

Managing on the cheap

Check out this week's story on free — or pretty close to it — management tools (page 41). Then go online for links to protocol analyzers, intrusion detection tools and system monitoring packages. Drop us a line with your favorite freebies.

DocFinder: 3226

Ron Nutter's Help Desk

A reader writes: "Our NT net is a little out of date and, in order to comply with corporate Y2K directives, we need to upgrade to NT 4 or start the rollout of the Windows 2000 Beta 3 currently available. What is the best thing to do?" See what Ron Nutter advises and add your suggestions.

DocFinder: 3229

Your 2 cents

If you use a LAN or enterprise net management platform, here is a chance to tell us what you think of it. We're gathering opinions for our 1999 Network and Systems Management Software survey. To participate, send an e-mail to aschurr@nww.com with your name, company, job title, snail-mail address and management platform.

Career Doctor

The counteroffer is a great tool employers have for retaining employees. But Career Doctor Shaun Kelly this week explains why counteroffers can be deadly to your career. He advises how to handle them and when to walk away.

DocFinder: 3230

Building up firewalls

Are you looking into setting up or revamping a firewall? Let us help you. Send us your firewall request for proposal (RFP), and if we select it, we'll send it to the vendors participating in our Firewalls Buyer's Guide and Review, to be published on July 19. Then we'll post your RFP and the vendors' responses online. To participate, e-mail your RFP to sgittlen@nww.com.

Network newbies

What better way to determine how to set up a network than to read about it step by step? We are looking for a reader to help us chronicle the creation of a net from start to finish. We'll work with you from the planning to the last installation. If you want your network featured, send an e-mail to sgittlen@nww.com.

Download of the week

Managing a huge Web site by hand is not a pleasant experience. Coast Software hopes to ease the pain with Coast Webmaster 4.1, which can be used to analyze, map, verify and update Web sites from a Windows-based PC. Version 4.1 features single-step deployment and global link repair. Webmasters can directly upload batches of files from a staging server to a production server. The tool can be configured to monitor Web sites for problems and send e-mail alerts. Webmaster 4.1 runs on Windows 95, 98 and NT. It supports most major Web servers and works with Netscape and Microsoft browsers. Come online and download Webmaster and other Web tools.

DocFinder: 3231

Help Desk

Ron Nutter is standing by to answer your networking questions. Read his column every week on Fusion. DocFinder: 2450

MISSION

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Opinions

Editorial Insights

Journey to DSL: 20 miles of bad road

I've been to DSL hell and back, and although I didn't care for the trip, so far I like the service. Then again, if you crawled through the desert for 30 thirsty days, you might be inclined to drink from the first pit of putrid water you found.

After ordering through US WEST, it took more than one month to get digital subscriber line (DSL) service in my home office. You would think that with fierce competition for broadband customers, US WEST's response would have been quicker.

After my initial 10-day wait for service, I was told DSL wouldn't work for me because it was installed on a rollover line, which fields calls from your main line if that line is busy. I ordered a different line and waited another 10 days. I begged US WEST not to send another $300 package that includes a DSL modem and network interface card, but it arrived in two days.

On my twentieth pre-DSL day, a US WEST installer needed only 25 minutes to get the modem operating system programmed on my end. But US WEST's central office wasn't ready — a bad port there kept me offline. I was assured a call would come in a few hours, and then I would be up and running. Two days passed. I paged the installer, and even his pleas for help went unanswered.

Now, two weeks after the $100 "install," I was left to complete it myself. US WEST confirmed my port was fixed. But I still had no connection, and I was sent into another black hole: US WEST.net, my ISP for DSL. (US WEST.net is a separate company from US WEST.)

My call was escalated to Tier 2 tech support, which didn't answer because a fire drill forced technicians to flee the building. I called the next night at 9:30. It's a silly mistake, tech support said. My modem operating system was set up for bridging and my operating system was programmed for the point-to-point protocol service I ordered. I was assured I'd see light in the morning.

Next morning, the connection was dark, Tier 2 support was busy, and I waited for the dreaded call back. I paged the original installer. He was at my office in 10 minutes. Over the next three hours, he bounced between US WEST and US WEST.net. We finally discovered US WEST.net was trying to repair service on the rollover line I had been forced to abandon.

I was assured a morning delivery. No go. Back to Tier 2 support and another assurance. The following morning, more than one month after requesting service, I had a 256K bit/sec pipe to the Internet. It was heaven after my hell.

Of course, now I have to go back to US WEST to get a static IP address so I can get through my corporate firewall.

— John Fontana
Senior editor
jfontana@nww.com

Message Queue

Unimpressive uptime

So Windows 2000 ran for 782 hours without a reboot ("Windows 2000 Beta 3 gets good early marks," May 10, page 14). I'm impressed — not. That's less than 33 days — shoot, even Windows 95 can last for 49.5 days, a good 50% longer than Windows 2000.

I ran WarpServer for eBusiness Beta 1 for more than 4,000 hours without a reboot; I only shut it down so I could move.

Thanks for the good laugh.
Sean Payne
Jacksonville, Fla.

Lowdown on showdown

In his review "NOS showdown: NT vs. Linux" (May 17, page 53), Tom Henderson writes that during the security test, OpenLinux had many unnecessary services listening on various ports, creating security holes. Any administrator worth his salt knows to turn off such unneeded daemons. They run by default as a convenience, but if you don't need them, turn them off. Apparently, Henderson wasn't impressed by the fact that most Linux port daemons are found in a single, easily editable file — I sure am.

I'm also confused as to why NetWare was left out of the comparison. The article states that it was because "NT and Linux are better positioned as application servers," yet the comparison dealt primarily with basic network operating system (NOS) performance, services, administration and connectivity. These are all areas in which NetWare and Novell Directory Services (NDS) have always excelled.

On the management side, did someone forget about Novell's ZENworks? My client workstation setups involve only a 3-minute ghosting of a basic NT image, and NDS/ZENworks does the rest, taking care of all applications, workstation policies, printer setups and user profile management.
Sebastian Mindling
Santa Rosa, Calif.

In reading your article "NOS showdown: NT vs. Linux," I was shocked that you didn't include reliability in the test. How can you compare these two and not include this important item? You can have all the scalability and manageability you want, but if the NOS isn't reliable, what use is it?

I run a Linux mail server that also handles all my company's Internet traffic through IP forwarding. I also run a Citrix WinFrame server that is running NT. There is no question in my mind that the Linux server is much more reliable.

By not testing reliability, I think you missed a major point in comparing these two NOSes that probably would have swayed the end results the other way.
Paul Cimino
Network administrator
Kurtz Bros.
Cleveland

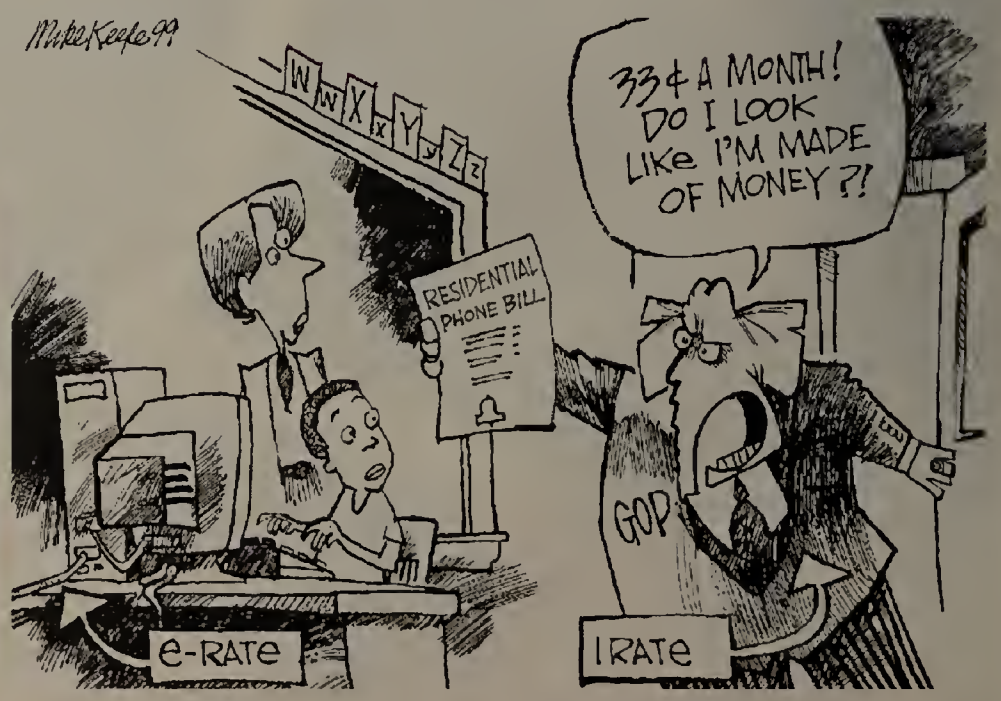
Henderson responds: In response to the first letter, the fact that the Linux services are installed as defaults raises an important point: You can't assume that a Linux deployment will be performed by a qualified, Unix-savvy individual. The default configuration may indeed represent the vendor-recommended settings for the operating system, and if those settings create vulnerabilities, that is detrimental.

Should Linux or NT be installed by an individual who knows the potential security flaws of the operating system and the services used by TCP/IP? Yes. But in reality, the default installation often remains for many reasons, ranging from educational problems to lack of diligence.

Regarding the point about NetWare, comparisons between evolving NetWare and Linux versions must be left to a future test. And as for ZENworks, it is an interesting product. However, we tested only the products that came inside the NOS boxes, and ZENworks wasn't inside either box.

Regarding the second letter: The point of the review was to confine the testing to the file-and-print capacities of each server, not general-purpose applications — that's another can of worms. The Citrix software is actually an OEM version of an older version of Windows NT 3.51, and as a terminal server it doesn't fit the confines of file and print.

Send letters to nwnews@nww.com or John Gallant, editorial director, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.



Management Mode . Jeff Shapiro

In the center ring: the IT dancing bears

Someone once said the amazing thing about a dancing bear is not how well it dances, but the fact that it dances at all. These days, as IT professionals we are all dancing bears.

In the late 1970s and early 1980s, IT management was a pretty easy job. The technology was a lot simpler, and managers who knew their technology could function very well. Calling us "managers" during that time was also a bit of a misnomer. We managed machines, not people. Other than the training component, one person could easily support several hundred computers, and there just weren't that many computers in use back then.

Since then, life has become a lot more complicated. Three trends have changed the shape and content of IT management and will continue to do so.

First, the continuing proliferation of computers and applications in the workplace has increased the workload per desktop at least fivefold. This means that we're spending five times as much time with our users as we used to. At the same time, the ratio of technology workers to desktops has dropped, but only by about half, to around one person per 150 computers. Simple math says we're working more than twice as hard as we did in the past.

Second, that same proliferation has brought a cornucopia of applications. For any given task, there are three, four or more programs available, and the larger your organization, the higher the probability that you have multiple programs to support that serve the same function. Stratification of network software, operating system and applications has also resulted in stratification in the technology workplace. We have network specialists, hardware specialists, desktop specialists and so on, which makes dividing user support responsibilities a lot harder than it once was. There's just too much knowledge out there for people to hold in their heads.

This has also resulted in the emergence of true IT managers in the sense that we manage information workers, not just information systems. We're typically the people who can hold a wide (but not deep) amount of information in our heads, have a good sense of the user environment, prioritize appropriately and have some basic people-management skills.

Lastly, the trends that have kept us hopping are going to continue to do so. Generations of desktop hardware change every 18 months. Operating systems are reintroduced and re-engineered every 24 months. Applications are updated once per year or more frequently. This requires us to continuously learn and absorb information, in order to support our existing users and protect our future ones. Meanwhile, nothing ever goes away, and we have to continue to support old programs, old operating systems and old computers.

If we look at what we had to do 10 or 20 years ago and compare that with what we have to do today, it truly is amazing that we still dance at all. The fact that we're dancing better than ever is almost beyond belief.

Shapiro is district technology coordinator for the Kingsport City Schools in Kingsport, Tenn. He can be reached at jshapiro@kpt.k12.tn.us.

Above the Cloud . James Kobielus

Microsoft, Nextel need to rethink wireless portal strategy

Microsoft recently took an equity stake in Nextel Communications and committed to building a co-branded Internet portal for Nextel's wireless data customers. Strategically, it's a smart move for both firms. Microsoft gains access to Nextel's fast-growing customer base of business users, many of whom spend a lot of time on the road and crave untethered access to the Internet. And Nextel gains much-needed capital for implementation of its nationwide wireless data network, overlaying its already well-established wireless voice system. The deal will also enable Nextel to present a default start-up page for its wireless data customers to access e-mail, calendaring, electronic commerce and other applications.

But nothing in Microsoft and Nextel's announcement shows even the slightest vision regarding the special requirements for a road-accessible wireless portal. Read between the lines and you will see a wimped-down version of the msn.com portal, reformatted for a small screen and limited keyboard, not a tool for the road warrior.

What's missing from Microsoft and Nextel's vision of the wireless portal? It lacks understanding of what mobile users truly need from the 'Net: information services tailored to the localities through which they're passing — where to stay, where to eat, where to entertain themselves, where to get medical help.

Bill Gates summed up Microsoft's cluelessness on this point: "Microsoft and Nextel will deliver the next generation of wireless services to enable people

YUCEL

everywhere to stay in touch with the information they need, regardless of location." But as far as mobile users are concerned, to paraphrase political consultant James Carville: "It's the location, stupid." Microsoft should integrate its portal with Nextel's user-location database, so it can deliver real-time information services appropriate to the user's current coordinates.

Also missing from Microsoft's wireless portal is any notion of vertical markets and their needs. Nextel's customer base consists only of vertical markets: public safety, field support and transportation personnel. Microsoft is dropping a horizontal-market consumer portal into an environment where users need information tailored to their industries. Microsoft should team with the 90-plus organizations crafting industry-specific applications for Nextel's wireless data net.

Another flaw with Microsoft and Nextel's proposed wireless portal is heavy reliance on "pull-mode" Web browsing. Most mobile users rely on lightweight pushed communications, such as paging and text e-mail, to supply them with information. Instead of HotMail, users need an IMAP4 e-mail service that will let them filter and control the messages they download or preview. Most information services should be delivered to Nextel users either through IMAP4 or paging, depending on how time-sensitive they are.

Speaking of wireless e-mail, Nextel's users already have access to the two-way Short Messaging Service (SMS), which is integrated with the carrier's Integrated Dispatch Enhanced Network (iDEN) airlink protocol. Does Microsoft plan to integrate its portal's e-mail service with Nextel SMS? It would be a serious disservice to Nextel's customers if they were required to check two e-mail inboxes: SMS and MSN HotMail.

Most fundamentally, the wireless portal must serve as the user interface for unified communications services, integrating delivery of telephony, e-mail, paging, voice mail and fax services to Nextel subscribers. There is no mention of a unified communications strategy in Microsoft and Nextel's announcement. There is no indication whether Nextel and its iDEN technology provider, Motorola, are designing their subscriber phones with a unified communications interface in mind. Any such terminal interface must dovetail closely with the design of the Microsoft-Nextel portal.

For most Nextel wireless-data customers, the carrier's portal will be their porthole to the Internet, and they will not be inclined to point their microbrowsers anywhere else. Let's hope Nextel, Microsoft and other business partners don't blow the chance to design a wireless portal to be proud of

Kobielus is an Alexandria, Va., analyst with The Burton Group, an IT advisory service that provides in-depth technology analysis for network planners. He can be reached at (703) 924-6224 or jkobielus@tbg.com. The opinions expressed are his own.

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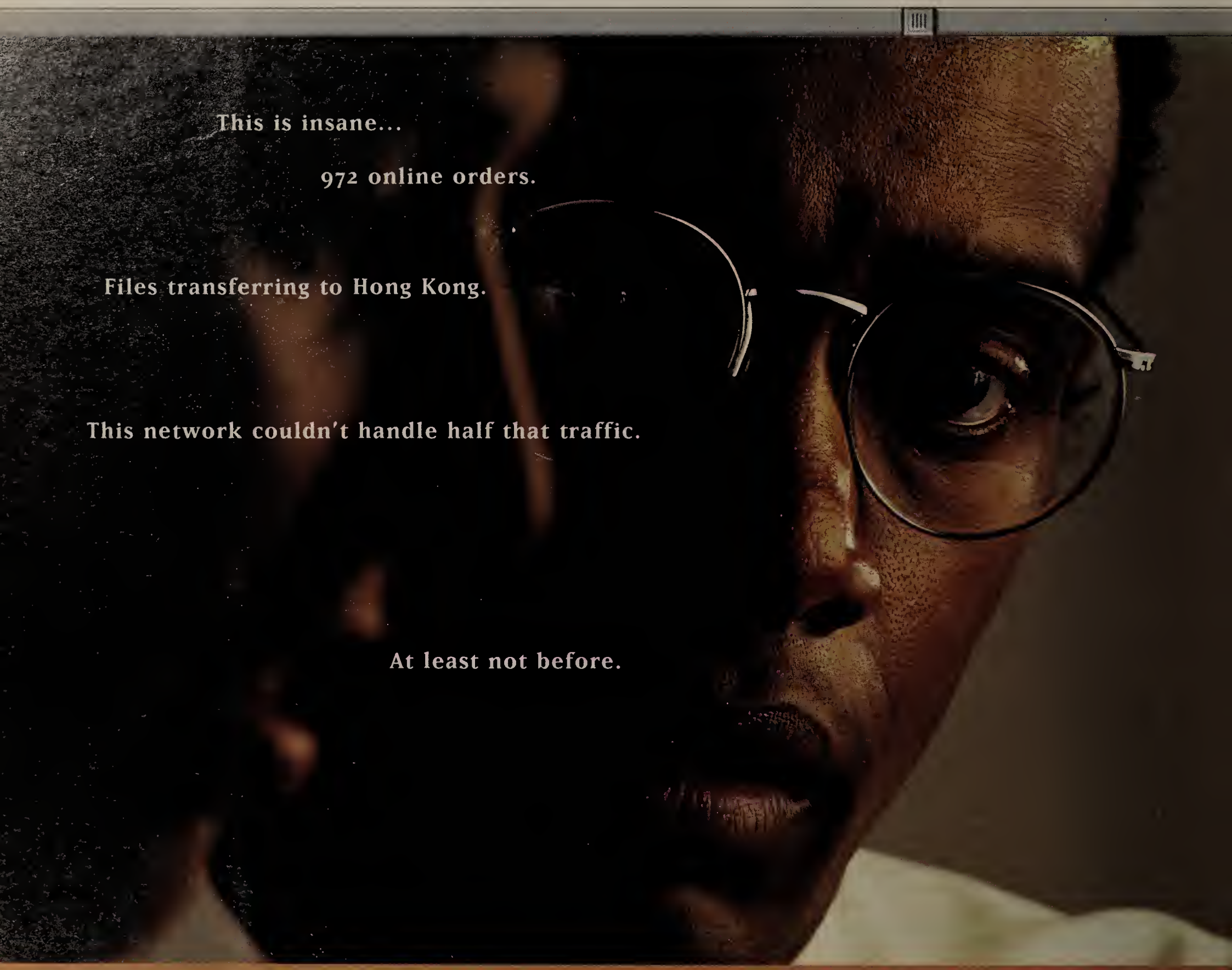

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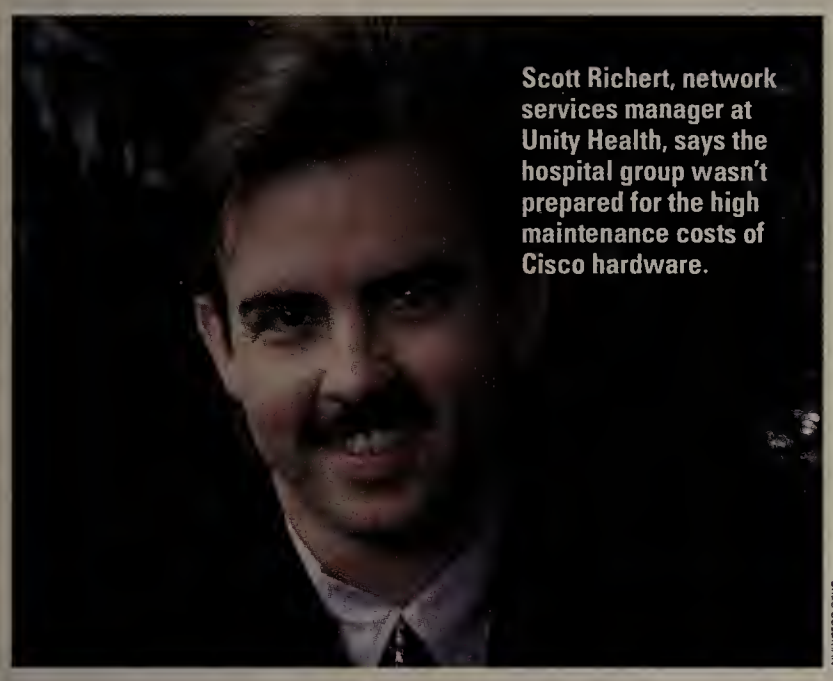
TCO TALL TALES

Continued from page 1

While each vendor claims that TCO is a key differentiator, they all recite the same chapter and verse to prove their point: Our products are more reliable, our management software is better, our service and support is tops and our training costs are the lowest.

For example, Nortel says if you use its Accelar 8000 switches throughout your enterprise network, you will lower your TCO because the product is less expensive and offers the best resiliency, the highest reliability and the lowest training costs.



Scott Richert, network services manager at Unity Health, says the hospital group wasn't prepared for the high maintenance costs of Cisco hardware.

GREG GOLDMAN

The vendor adds that its Unified Network Management scheme for integrating management of its LAN products, Passport switches and Meridian PBXs dramatically reduces the TCO. A company spokesman says there was documentation to back up those claims, but that the information couldn't be released.

3Com makes an almost identical claim. An enterprise network based on the CoreBuilder 9000 series of Layer 2/Layer 3 switches delivers a dramatic decrease in both equipment and people costs, especially in the areas of training and service, the company contends.

Furthermore, 3Com recently commissioned a report from Renaissance Worldwide, a consultancy based in Lincoln, Mass., on the cost of ownership of Layer 3 switched networks. The report surveyed users and concluded that 3Com shops have the best TCO story based on a higher ratio of support people per desktop and a lower salary cost per staffer.

However, the report also discloses that only nine shops in all were surveyed; five 3Com sites, two Cisco sites, and only one site each for Cabletron and Nortel. The tiny sample size certainly calls into question the survey results.

Cisco CEO John Chambers, in a recent Network World interview, argued that customer decision making has changed dramatically over the past few years. "You began to see people reduce the number of vendors in the network to just one or two or three," he said. "That's really driven by the cost of ownership."

Cisco produced a white paper that also uses figures from Renaissance Worldwide to argue that going with a strategic vendor — Cisco — for end-to-end network needs can dramatically reduce TCO.

Not surprisingly, Cabletron sees things a bit differently. Although the firm declined to provide any documentation to support its claims, Cabletron's position is that it offers the best TCO because it can tie together best-of-breed point products with its Spectrum management suite. Cabletron has a white paper on its Web site that describes its TCO advantage, including a detailed case study. Of course, the end user in the case study is Cabletron itself.

The result of all this vendorspeak is that users are at a loss when it comes time to evaluate competing proposals.

For example, Greg Catalano, senior staff consultant at Boise Cascade in Boise, Idaho, looked at TCO when the paper manufacturer decided to upgrade its networks a couple years ago. Rather than take a narrow focus on the capital cost for hardware and software, Catalano looked at the bigger picture — service and support, maintenance, staffing levels and remote management capabilities.

He analyzed proposals from 3Com, IBM, Cabletron and Nortel and was simply unable to differentiate between them when it came to TCO. Catalano says he selected Cabletron because at the time it had the best technology for integrating multiple protocols and traffic types onto one chassis.

Similarly, Jim Barry, chief information officer at Insurance Holdings of America, a 2-year-old insurance company headquartered in Beverly, Mass., looked at TCO when he was determining the best way to build a network that includes more than 100 field offices and a call center in Oriskany, N.Y.

He analyzed the total cost of hardware, software and staff required to manage his call center and remote offices, and decided to go with a centralized management structure based on Tivoli's NetView and 3Com's Transcend management software. He estimates that he is saving $500,000 per year in staffing costs.

But after Barry had made the architectural decision, the choice of vendors came down to factors other than TCO. He says 3Com won because it differentiated itself based first on price and second on the fact that its Gigabit Ethernet switch had been on the market longer than similar products from Cisco and the Bay Networks division of Nortel.

Although you may not be able to select one vendor over another based on TCO, there is widespread agreement that doing some form of TCO analysis is vital whenever you're looking at a major upgrade or at outsourcing.

The argument is compelling: If you're only looking at the price of hardware and software, you're missing the bigger picture and leaving yourself open for some nasty budget overruns down the road.

Gartner Group, which pioneered the concept of desktop TCO, has expanded its analysis to include LAN and WAN costs. According to Gartner, 26% of the total cost of a LAN is hardware and software; the rest is labor costs. On the WAN side, 56 cents out of every dollar goes to service providers, while 44 cents is spent on administration, support and equipment, according to Gartner Group analyst Ken McGee.

"Network budgets and projections made for this fiscal year in many enterprises have been consistently 100% off the mark," McGee says. "All too often, IT management has neglected to factor in the true TCO, forgetting the expense and impact on the bottom line of network backup, non-networking staff and labor costs, and other support costs."

Experts agree that many net administrators don't see the bigger TCO picture.

"Most customers do not fully understand and appreciate all the finer aspects of TCO. They see the hard dollar costs and often not the complete costs," adds Anil Kumar, senior manager at Deloitte Consulting's Atlanta office.

In fact, many companies have no idea what their actual costs are for voice and data services. Kumar says it's not unusual for him to work with a company that thinks it's spending $10 million on its networks, but is actually spending closer to $15 million or even $20 million. There are hidden costs everywhere: local phone bills that are paid by branch offices or pager and wireless bills that are put on individual expense accounts, for example.

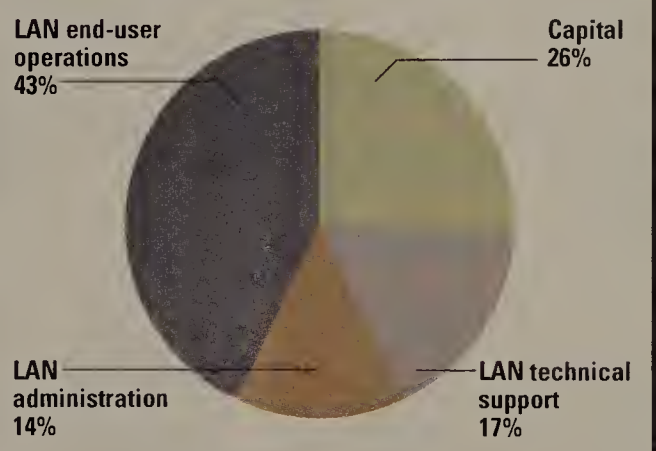
Unity Health, a St. Louis-based group of hospitals, didn't bother with TCO when it spent about $12 million to merge the network infrastructures at six hospitals. Unity didn't have much choice; it was racing against the clock to become Year 2000-compliant.

Looking back, network services manager Scott Richert says: "TCO analysis of the network infrastructure investment in Cisco switches, routers and ATM gear was probably an area that we didn't look at closely enough."

Unity Health budgeted for a big hit in capital expenses during the year of the expansion project, but the company wasn't ready for the increase in operating expenses the following year. Richert says the cost of maintenance contracts was a big surprise; Unity ended up buying maintenance contracts for its most critical backbone equipment but not for its less-critical LAN switches.

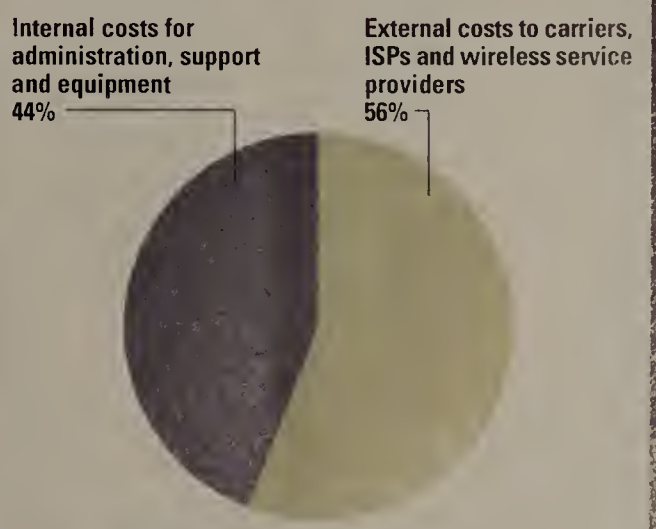
On the other hand, Boise Cascade's Catalano says his TCO analysis was very helpful in identifying areas where he could save money. For example, by using

Labor costs hog a big piece of the LAN TCO pie



SOURCE: GARTNER GROUP, STAMFORD, CONN

WAN TCO analysis shows that big bucks go to the service providers



SOURCE: GARTNER GROUP, STAMFORD, CONN

Cabletron's remote management tools, he was able to eliminate seven positions in branch offices.

Catalano says he's currently tied up with Y2K work, but next year he intends to look into merging his voice and data traffic. When he does, he plans to perform a TCO analysis.

Barry says he calculated the trade-offs between higher cost and higher reliability when building his insurance company network and opted to spend more money for redundancy. "They call me Noah because I have two of everything," Barry says.

In Greg Fadul's case, the network is the business. Fadul is the vice president of network operations at Conxus Communications, a 4-year-old wireless voice messaging service provider headquartered in Greenville, S.C.

Fadul brought in Wang Global, based in Billerica, Mass., as a consultant to help him perform an extensive network TCO analysis of capital costs vs. operating expenses. He had to determine how many wireless transmitter sites he needed to serve a particular geographic area. Then he had to decide how many staff people he needed to maintain the transmitters. Plus, he had to draw up a plan for where to locate the physical sites that aggregate traffic from multiple transmitters.

To add to the complexity of the decision-making process, Fadul decided to go with MCI WorldCom as his vendor for frame relay service between the transmitters and the regional, connector sites. Because MCI WorldCom's pricing model is based on distance, there was an incentive for him to build more regional sites, thus cutting down the length of his frame relay links. At the same time, however, more sites meant higher staffing costs than having just one central hub.

In the end, Fadul decided on what he calls a middle-of-the-road approach in which he not only tried to keep capital costs in line, but also tried to keep operational costs low enough so that the company's break-even point would be attainable.

Over the past four years, Conxus has deployed more than 1,000 radio frequency transmitter/receivers that connect over frame relay links to seven regional sites. Plus, the company has three major hubs that handle incoming voice calls.

In an effort to further reduce TCO, Fadul currently is moving about half of his frame relay traffic to Sprint, which offers distance-insensitive pricing.

This is allowing Fadul to decommission some of his regional frame relay sites and move to a more centralized architecture.

If the type of analysis Fadul undertook sounds complicated, it is. A full-blown TCO analysis by Deloitte Consulting or Wang Global would include determining the costs for training, integration and testing, network management, network security, network downtime, maintenance contracts, purchase negotiations and change management.

On top of that, many analysts now argue that calculating your TCO is only the first step. Mary Hartman, an analyst at International Data Corp. in Framingham, Mass., says TCO has limited value. "By its very nature, TCO concentrates on costs alone and does not consider potential benefits beyond cost savings," she says.

Hartman says focusing solely on TCO effectively portrays IT as a cost center instead of a revenue generator. She adds: "If you can't show a direct link between technology and strategic goals, then you've got a bad idea. There has to be a business reason behind everything you're doing."

Mike Pedersen, senior vice president at Meta Group Consulting, says it's expected that network managers will run their infrastructure cost effectively. What's more important is how they can provide value.

"It's not just fixing your desktop faster. You're in a no-win situation if you are unable to tie infrastructure back to business applications," Pedersen says.

And the first step is getting a handle on TCO. ◪

Network TCO in a nutshell

Cost to provide network support to one end user per year:

Capital	$3,445
Staff	$5,564
Facilities	$955
Total	$9,964

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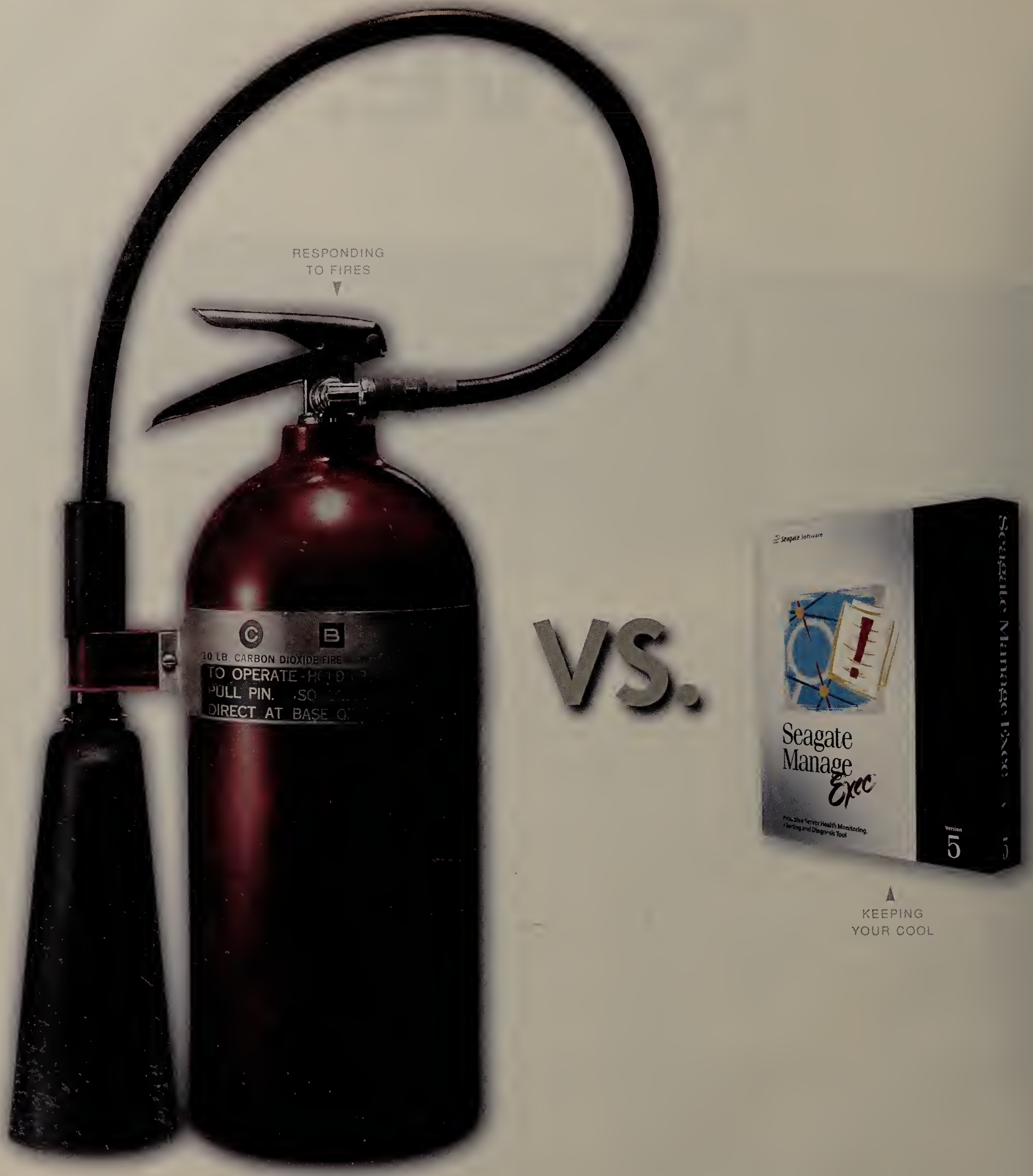

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BY MARK GIBBS,
NETWORK WORLD TEST ALLIANCE

Review

PARTNERSHIP PLATFORMS

SoftArc's FirstClass Intranet Server leads the collaboration pack, but Cobalt's Qube 2 isn't far behind.

Too often, it's difficult for colleagues to collaborate. One reason is that determining the best way for groups to work together paralyzes many IT departments.

We looked at three products that attempt to solve the collaboration problem by giving organizations multiple means of communication. All the products include a Web server, an e-mail server and some means of interactive discussion, in the manner of Usenet newsgroups.

SoftArc's FirstClass Intranet Server (FCIS) came out tops in our tests. This sophisticated bulletin board system (BBS) runs on Mac OS and Windows NT. It can communicate with client systems over dial-up connections as well as TCP/IP, IPX and AppleTalk. FCIS comes with its own custom client and also allows full access to browser users. The product offers many features: threaded discussion lists; standards-based e-mail that integrates with FCIS' proprietary messaging services; news services that link to Usenet newsgroups; chat services; file archives accessible via the FirstClass client software and File Transfer Protocol (FTP); and the ability to send list server traffic to a conference.

FCIS' bundled client interfaee and the interface presented through Web browsers are well-designed, and there's even telnet support for die-hard command-line junkies.

Product: FirstClass Intranet Server

Vendor: SoftArc

FCIS wins the Blue Ribbon for a full range of collaboration features in an easy-to-manage package.

NetworkWorld Blue Ribbon

The system is extensible and has attracted a flock of third-party developers. In short, we were very impressed. FCIS is good looking and well-featured, and the system's overall performance is excellent.

Running a close second was Cobalt Networks' Qube 2, a hardware and software bundle. The hardware includes a 64-bit Reduced Instruction Set Computing processor with 16M bytes of RAM, a 3.2G-byte hard disk, two 10/100Base-T Ethernet interfaces, a PCI slot and a high-speed serial port for dial-up Internet services. The software includes Linux 2.0 with the Apache 1.3 Web server, standards-based e-mail, FTP, firewall and IP gateway services, and a content search engine.

You can do all the setup and maintenance through the product's Web interface, except for the initial IP configuration, which you program on a control panel on the back of the server. Qube 2 also supports telnet access, although you need a good working knowledge of Linux to succeed with telnet.

Qube 2's user interface is completely Web-based. It organizes all the product's facilities hierarchically, keeping the presentation clean and simple.

Finishing a distant third was the Santronics' Wildcat Interactive Net Server (WINS). To misquote Dorothy Parker, this is not a product to be tossed aside lightly — it should be thrown with great force.

WINS started life as Wildcat, a multiline dial-up BBS, and over the years IPX and IP networking were added. In its time, Wildcat was one of the very best BBS products available, but it has become long in the tooth. Santronics purchased WINS from Mustang Software late last year and appears to have done little to make the product its own. Throughout the software and documentation there are references to Mustang's name, phone numbers and Web site. Moreover, Santronics has done little to modernize the product, which came out in 1996 and was antique by market standards at the time it was acquired by Santronics.

While WINS does have conferences, newsgroup support, proprietary and Internet e-mail, and a Web interface that all work well, we found the product to be overly complex, clumsy in certain areas and a poor value.

Feature comparison

Feature	FCIS	Qube 2	WINS
Internet e-mail (SMTP/POP3)	✓	✓	✓
Internet Message Access Protocol	✓	✓	✗
Web server (HTTP)	✓	✓	✓
Telnet access	✓	✓	✓
Discussion groups	✓	✓	✓
Real-time chat service	✓	✗	✓
File Transfer Protocol	✓	✓	✓
SNMP	✗	✓	✗
Newsgroups (NNTP)	✓	✓	✓
Network Time Protocol	✗	✓	✗
Windows network support Server Message Block	✗	✓	✗
Apple FileTalk Protocol	✓	✓	✗
FrontPage extensions	✗	✓	✗
Domain Name System	✗	✓	✗
Dynamic Host Configuration Protocol	✗	✓	✗
Lightweight Directory Access Protocol	✓	✗	✗

Custom client access

SoftArc's FCIS and Santronics' WINS have special client applications. Both let you access their server applications from a Web browser.

The FCIS client is easy to install. When you run the client, you are presented with a logon dialog that is a little more complex than we'd like to see for a general user environment. The dialog lets you choose a settings file in which a set of logon parameters is stored. The logon parameters include the server you want to log on to as well as the user name, and optionally, the associated password, which is masked for security.

Unfortunately, if you choose to save the password there's no way to erase it without entering and storing an incorrect password — hardly an intuitive process. The real issue is that you probably will not want users to be able to save passwords at all; sadly, that is not something you can disable.

ScoreCard	Management and administration 20%	Web services 15%	Messaging 15%	Discussion features 15%	Performance 15%	Installation 10%	Documentation and online help 10%	Total score
FirstClass Intranet Server	9 x .20 = 1.80	9 x .15 = 1.35	8 x .15 = 1.20	9 x .15 = 1.35	9 x .15 = 1.35	8 x .10 = 0.80	9 x .10 = 0.90	8.75
Qube 2	8 x .20 = 1.60	9 x .15 = 1.35	8 x .15 = 1.20	7 x .15 = 1.05	9 x .15 = 1.35	9 x .10 = 0.90	6 x .10 = 0.60	8.05
Wildcat Interactive Net Server	2 x .20 = 0.40	5 x .15 = 0.75	6 x .15 = 0.90	6 x .15 = 0.90	7 x .15 = 1.05	5 x .10 = 0.50	3 x .10 = 0.30	4.80

Individual category scores are based on a scale of 1 to 10. **Percentages** are the weight given each category in determining the **total score.**

Net Results

FirstClass Intranet Server
SoftArc
(800) 763-8272, (905) 415-7000
www.business.softarc.com/index.shtml
$995 per server, which includes 10 user licenses.

Pros
- ▲ Extensible
- ▲ Excellent performance

Cons
- ▼ Complex management
- ▼ User interface makes poor use of multiple windows

Qube 2
Cobalt Networks
(650) 930-2500
www.cobaltnetworks.com/products/index.html
$999 for basic model (16M bytes of RAM, 3.2G-byte drive) with unlimited users.

Pros
- ▲ Easy to install
- ▲ Excellent performance

Cons
- ▼ Advanced configuration is difficult
- ▼ Documentation could be improved

Wildcat Interactive Net Server
Santronics Software
(800) 845-6944, (305) 248-3204
www.santronics.com/products/winserver
$1,495 for 16-user Business Edition, $3,995 for 64-user Enterprise Edition with Microsoft Exchange integration.

Pros
- ▲ Simple installation
- ▲ Good Web interface

Cons
- ▼ Weak management
- ▼ Poor documentation
- ▼ Clunky architecture
- ▼ Overly complex
- ▼ Poor value for the price

As soon as you get connected, you are presented with a window containing folders for each service: mailbox, news, conferences and help. Double-clicking on a folder opens a separate window, so you can wind up with a lot going on quickly. What the client needs is a "Window" menu item to make it easy to jump from window to window.

Other than these minor criticisms, the FCIS client is very well-engineered. It responds quickly and looks good.

In sharp contrast, the WINS client is ugly and overly complex to install. Called Navigator, the client is a collection of applications that can be run directly from a toolbar or as helpers to Microsoft's Internet Explorer.

You can't access a WINS server with Navigator over an IP connection. You need the intermediation of something called a "virtual Winsock." This subsystem has compatibility problems with Windows 95, 98 and NT and Explorer 4.0 Active Desktop — the latter must be switched off if the virtual Winsock is run. In short, this system is a real pain to install and may be incompatible with the majority of corporate desktops.

Web access

If you choose to access your collaboration server via a browser, be warned that neither FCIS nor WINS support Web access via Secure Sockets Layer (SSL) connections. To overcome this, only allow client access across the Internet through a virtual private network product. SSL access is an option on Qube 2.

Logging on to an FCIS server with a Web browser is much cleaner than with the FCIS client. You only need to enter a user name and password. Once you get in, you're presented with an interface that does everything the FCIS client does, although the Web interface is a little slower than the custom client.

Web access is the main interface for the Qube 2 server. Users who want to make changes or look at private content have to authenticate themselves; unauthenticated users can only browse the public content. Qube 2's Web interface works well for access to administrative functions and user services.

Santronics' WINS makes Web access more difficult. Let us save you a lot of time when you're trying to set up Web service: You need to add a link on the Web service's default home page to let users access HTML content. Unfortunately, the details are not in the paper documentation; they're in the online help file called "Administrator's Guide" under "Enabling Dynamic HTML."

If you don't provide the link to HTML content, you'll only be able to see links that assume you're running the client software. In that case, following a Web link to a service will invoke the appropriate WINS client application as a browser "helper" program.

When you do access the WINS server through HTML, you'll find a clean and well-organized presentation of services, in sharp contrast to the rest of the product.

Services

All the products support Simple Mail Transfer Protocol/Post Office Protocol 3, internal e-mail lists and integration with external e-mail lists and newsgroups. WINS and FCIS have their own proprietary messaging systems as well, and FCIS and Qube 2 also offer built-in Internet Message Access Protocol 4 support.

Discussion groups are supported on all products through Web interfaces. WINS and FCIS also provide access through their client software. WINS' discussion interface, particularly in the custom client, is functional but could use some cosmetic work.

The performance of all these products is dependent on the platform on which they are installed and the specific configuration selected by the administrator. We found no performance issues in our testing of any of the products.

FCIS Web services are well-documented and extending them to create custom content is covered in depth. FCIS offers a large number of custom HTML tags that reference the product's features, such as the messaging system and conferences. The server interprets these tags on the fly to create dynamic Web pages.

Qube 2's Web services are provided by the bundled Apache Web server. Unfortunately, Cobalt doesn't document ways to extend these services. In various places in the administration system, you are warned that certain unspecified modifications may invalidate the warranty — not a very helpful approach. Qube 2 provides a basic page-building system through the Web interface, but because it also supports FrontPage extensions, it's better not to bother with it in favor of the better tool.

If you really want to, you could set up WINS to create Web content by running external custom programs, but it is neither simple nor based on any standards such as Common Gateway Interface.

Installation and documentation

Installing FCIS is straightforward, but the process becomes much more complex when you begin configuration. FCIS is a complex product, and despite the extensive and well-written documentation, there's a lot to learn once you go beyond the basics. On the other hand, when you compare FCIS to, say, Lotus Notes or Novell GroupWise, you have a collaboration application that is a lot less expensive and arguably more manageable.

Installing Qube 2 is simple, and configuration is straightforward. The paper documentation is minimal, and while more can be found on the Cobalt Web site, you can get by without it.

However, if you want to create a configuration that goes beyond the basics, there's not much support. This means that multihoming — assigning multiple IP addresses to a single network interface, changing the configuration of the FrontPage extensions and handling e-mail through the Web interface are not supported, which seem to be significant omissions. Even so, Qube 2 is outstanding in terms of performance and its value for the money.

As for WINS, we've said it already: The product has an eccentric and aging architecture and is poorly documented. We can't recommend it.

Gibbs is a Network World *contributing editor and columnist, and a marketing and technology consultant. He can be reached at mgibbs@gibbs.com.*

How we did it

We looked at product architectures, operation, configuration, installation and documentation.

Our test hardware was a Chatcom server populated with three 200-MHz Pentium II server boards each with 128M bytes of RAM and running Windows NT Server 4.0 with Service Pack 3. One board was our mail server running the FTGate Mail Gateway from Floosietek and Microsoft Domain Name System server. The other two boards hosted the FCIS and WINS servers. We connected the Qube 2 into the same network and used various other machines on our 100Base-T network as clients.

We configured each product with at least 50 users and five groups, as well as 10 bulletin boards. We posted 10 messages to each bulletin board and uploaded and downloaded 25 files 10 times from five clients. Two clients uploaded a total of 100 documents to the servers. We exchanged 100 messages between five clients simultaneously.

Gibbs is also a member of the Network World Test Alliance, a cooperative of the premier reviewers in the network industry, each bringing to bear years of practical experience on every review. For more Test Alliance information, including what it takes to become a member, go to www.nwfusion.com/alliance.

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Since its introduction, Adobe's Acrobat has been the most popular software product for allowing users on different computer systems to read each other's files. But these days, Microsoft Word is so common that it's a de facto exchange format, and Word documents can be modified, whereas, until now, Acrobat files could not. Adobe had some catching up to do if Acrobat was going to survive.

With Acrobat 4.0, Adobe breathes new life into an application that was threatened with obsolescence. This most recent version, released last month, takes the product in healthy new directions.

You can now digitally sign Adobe Portable Definition Format (PDF) files so recipients can verify they haven't been modified. A recipient can annotate or add to the file, then sign it himself and pass it along again. Any recipient can roll back to anyone's digital signature, creating built-in version control. You can do a side-by-side comparison of two versions of a document to easily spot changes.

Web pages and browser interfaces are also excellent ways to present layouts combining text and graphics, though putting together sophisticated content isn't always easy. Acrobat 4.0 lets you convert HTML pages to PDF format, preserving hyperlinks intact. Why would you want to do that, when it's generally easier just to mail someone a URL? E-mailed links don't always work with active content, and not all Web pages have long shelf lives.

With a PDF file of a Web page, you can use Acrobat to mark up and annotate pages — to say, for example, "Why can't we do this on our Web page?" You can add notes, highlight text and objects, and add audio annotation. You can annotate a PDF document by attaching a file to it, to say, "Here — make our page look like this, but with this information."

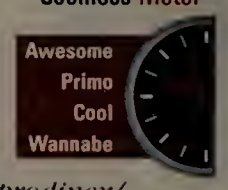
Also new are macros that you can access by clicking a button on a toolbar in Microsoft Office applications. PDFMaker and PDFWriter let you save Word, Excel and PowerPoint documents in PDF format. You can also open Office documents directly within Acrobat; the application automatically converts them to PDF. With other applications, you can drag a document to the Acrobat icon to convert it. And you can save and e-mail a PDF file in a single step using any MAPI-enabled e-mail application.

With a complex page made up of text and graphics, a PDF file takes up more space than the individual components. For instance, all the items on our Network World Fusion home page took up about 92K bytes of space in our browser cache. A PDF file made of the same page took 171K bytes — almost twice as large. But on the plus side, the PDF file combines dozens of elements — HTML code, graphics and style sheets — into a single manageable unit.

The improvements in Acrobat 4.0 make it a must-have for anyone already benefiting from Acrobat 3. ◪

Net Results

Coolness Meter



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Keeping out of the courtroom

Choose your company's metatag keywords carefully to avoid liability.

BY KURT OLENDER

It's all well and good to try to push your company's name to the top of the Internet search engine results heap, but your firm could be vulnerable to a lawsuit based on the metatags you use to accomplish that goal.

Internet search engines rank search results according to the relevancy of the metatag keywords your Web developers include in HTML code to describe its content. But if your firm's metatag keywords refer to your competitor's names, products or trademarks, there could be trouble.

Traditional trademark and unfair competition laws prevent a competitor from adopting your product name or making misleading statements about your product or firm. In most circumstances, wrongdoing is obvious when a competitor openly promotes a trademark as its own or uses misleading statements in its advertisements.

While most companies know they can't use a competitor's name or products to promote their own wares, many would not recognize that using a competitor's name in their Web metatags may constitute a legally actionable infringement. Similarly, most aren't aware that the use of words in their metatags that relate to a competitor's products, but not to the company's own products, could lead to liability under unfair competition laws.

A recent court decision gives companies contemplating such actions reason to reconsider and serves as a reminder that, while competition remains vibrant on the Internet, competitive practices must remain fair.

Niton Corp. manufactures machines that detect lead in paint. The company created a Web site to advertise and promote its products. Its competitor, Radiation Monitoring Devices, promotes similar products on its Web sites. But instead of simply using metatags that referred to its own products, Radiation Monitoring used metatags that only pertained to Niton's products. As a result, customers who used an Internet search engine specifically to find Niton's Web site or its products were misdirected to Radiation Monitoring's home page.

SISA/VICKY RABINOWICZ

Niton sued Radiation Monitoring for trademark infringement and unfair competition. The court ruled that Radiation Monitoring's improper use of metatags was deceitful and likely to lead people to believe that Radiation Monitoring and its products were associated with Niton. The court ordered the company to take down its Web site until the firm removed the offending references and metatags.

While this court decision may appear to apply to a subtle and unique situation, the reality is that any company conducting business on the Internet must make a concerted effort to determine if its metatags could invite a lawsuit.

Shinu Gupta, founder of the college textbooks online purveyor A1Books.com, says it's crucial for his firm to remain visible in the highly competitive online book market. His firm performs frequent Internet searches to determine the best metatags to associate with its site and to see if a competitor is misusing metatags to divert business from A1Books.com.

"My company gives serious consideration to the metatags that we use to ensure that we will not unwittingly infringe on someone else's rights," he says.

Because of the general absence of any formal monitoring of competitive practices on the Internet, a company must be aware of its competitor's practices and investigate the validity of proposed metatags before adopting them.

When computer consulting firm Stratis Group launches a Web site for one of its clients, it is careful to avoid subjecting itself or the client to liability based upon inappropriate use of metatags.

"While we rely heavily on the accuracy of the information provided by our customers, in situations where we believe the client may be exposing itself to a problem, we will advise the client to contact its legal counsel to determine whether the metatags are appropriate," says David Roth, president of the firm in Murray Hill, N.J.

Whether your company is exposing itself to a potential lawsuit through the use of metatags will substantially depend on how well the tags relate to your company's name, products or services. At a very minimum, your Webmaster should choose metatags that directly and accurately relate to your company's name, products or services. Avoid metatags that refer to your competitor or products and services that are unrelated to your company.

As with most business decisions, common sense must prevail in the selection of metatags. If you wouldn't include the metatags in a printed advertisement, you shouldn't use them on the Internet. The free flow of information on the Internet virtually guarantees that a competitor will discover misleading use of a metatag. As evidenced by the Niton case, this mistake could cost your company dearly.

Olender is an attorney with Mandelbaum, Salsburg, Gold, Lazris, Discenza & Steinberg in West Orange, N.J., specializing in intellectual property issues. He can be reached at kolender@msg-law.com or (973) 736-4600.

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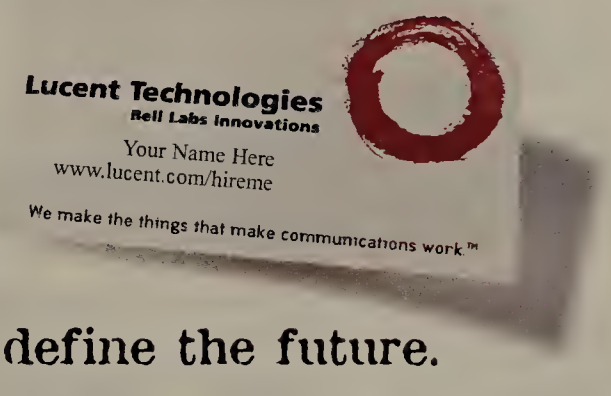

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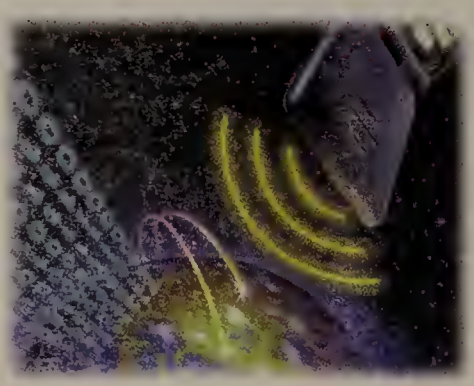

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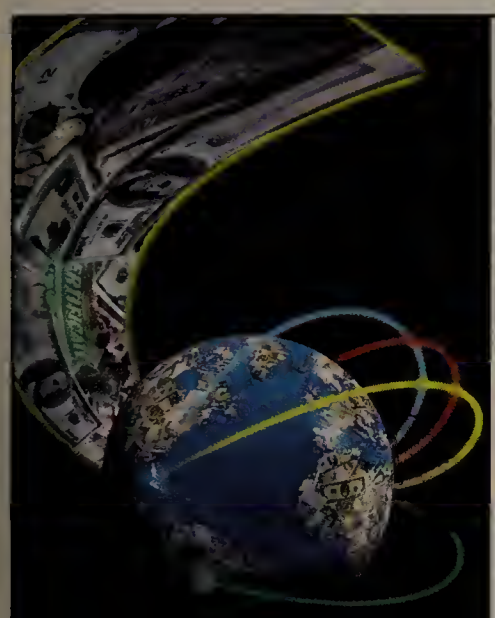

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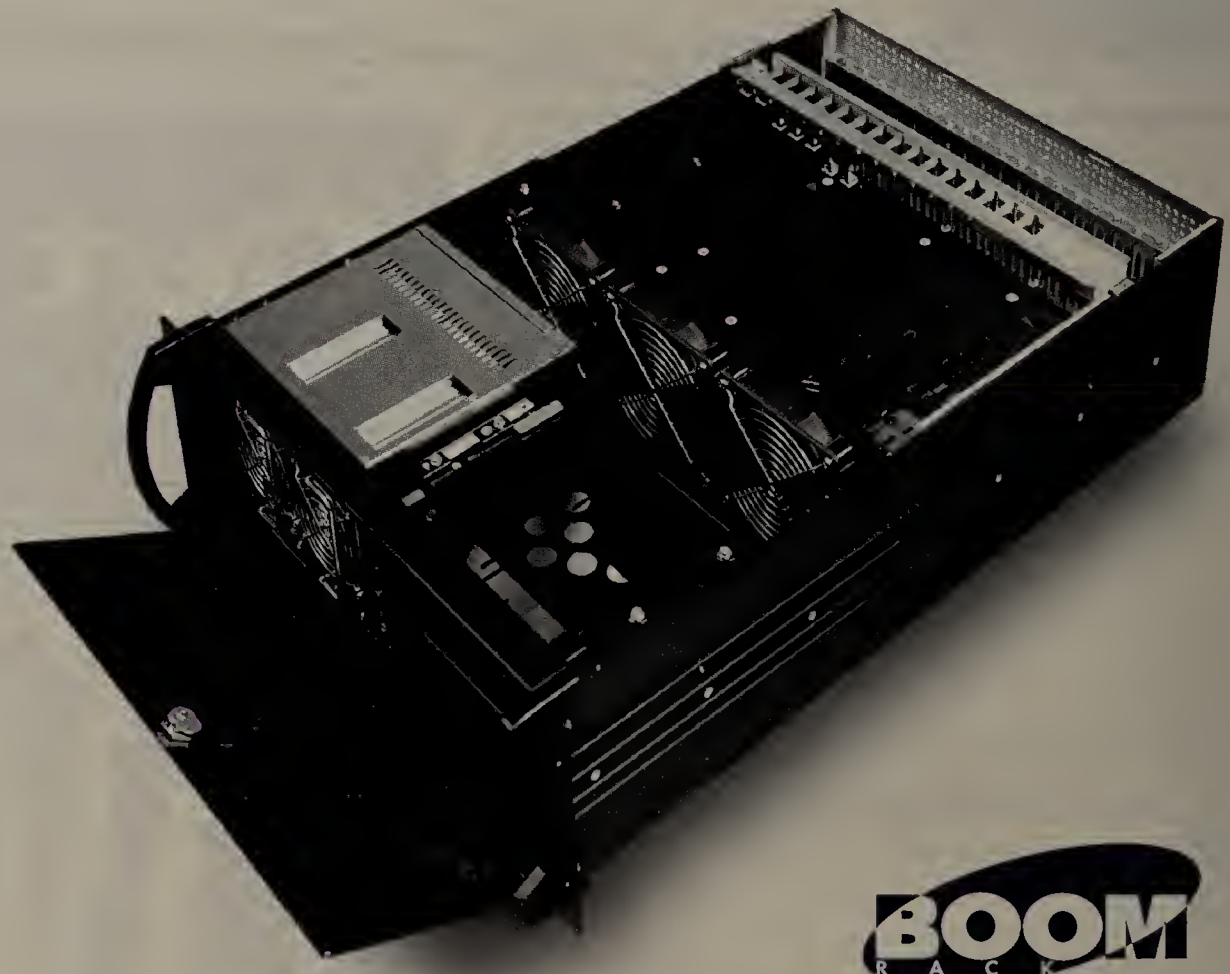

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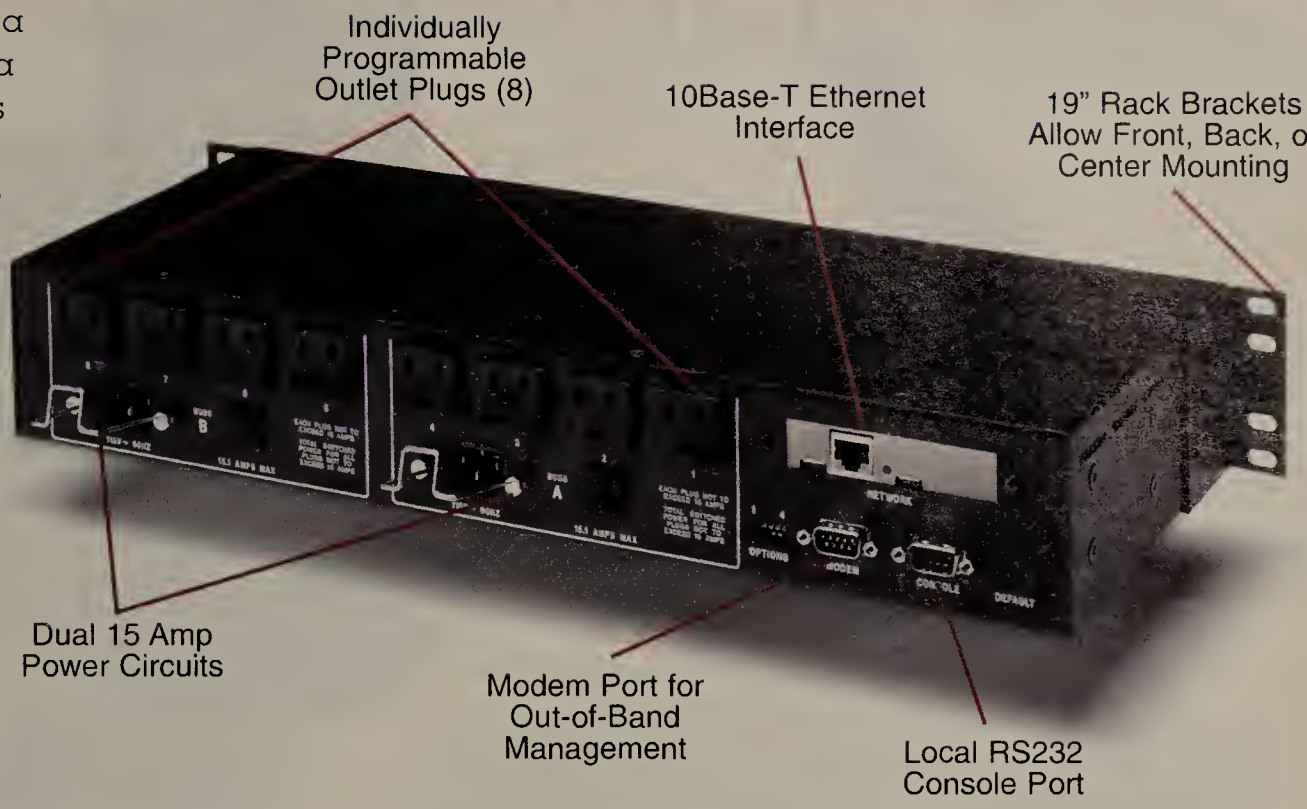

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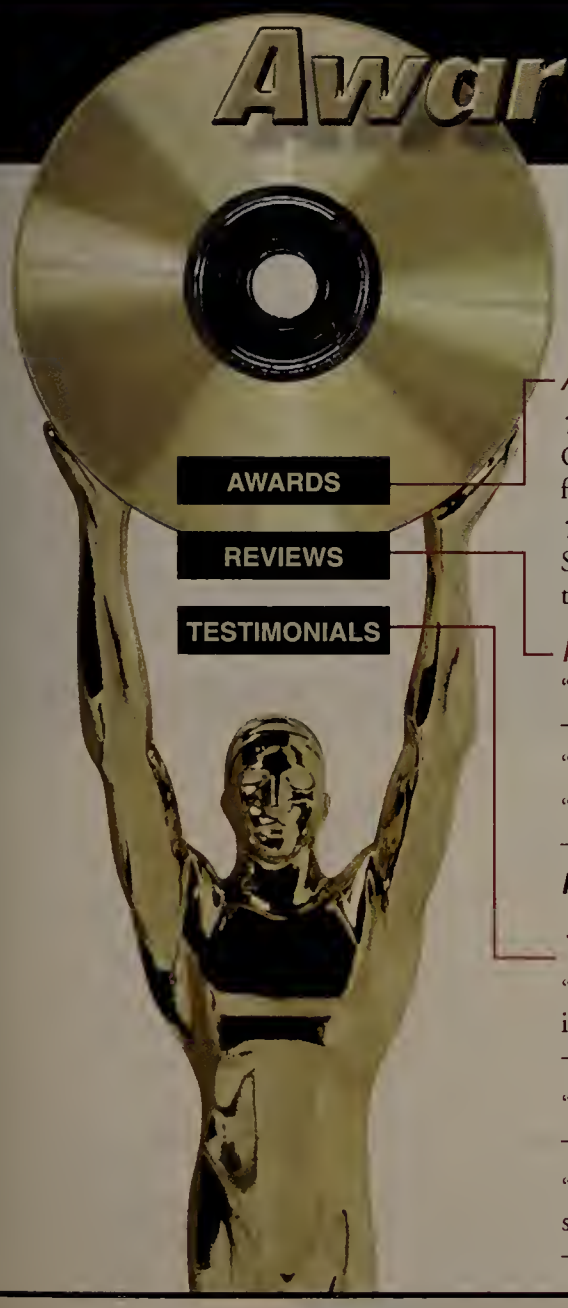

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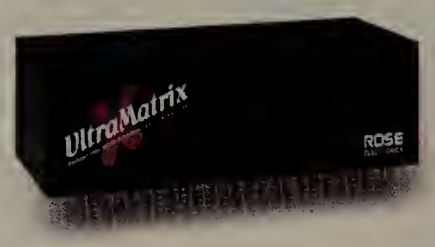

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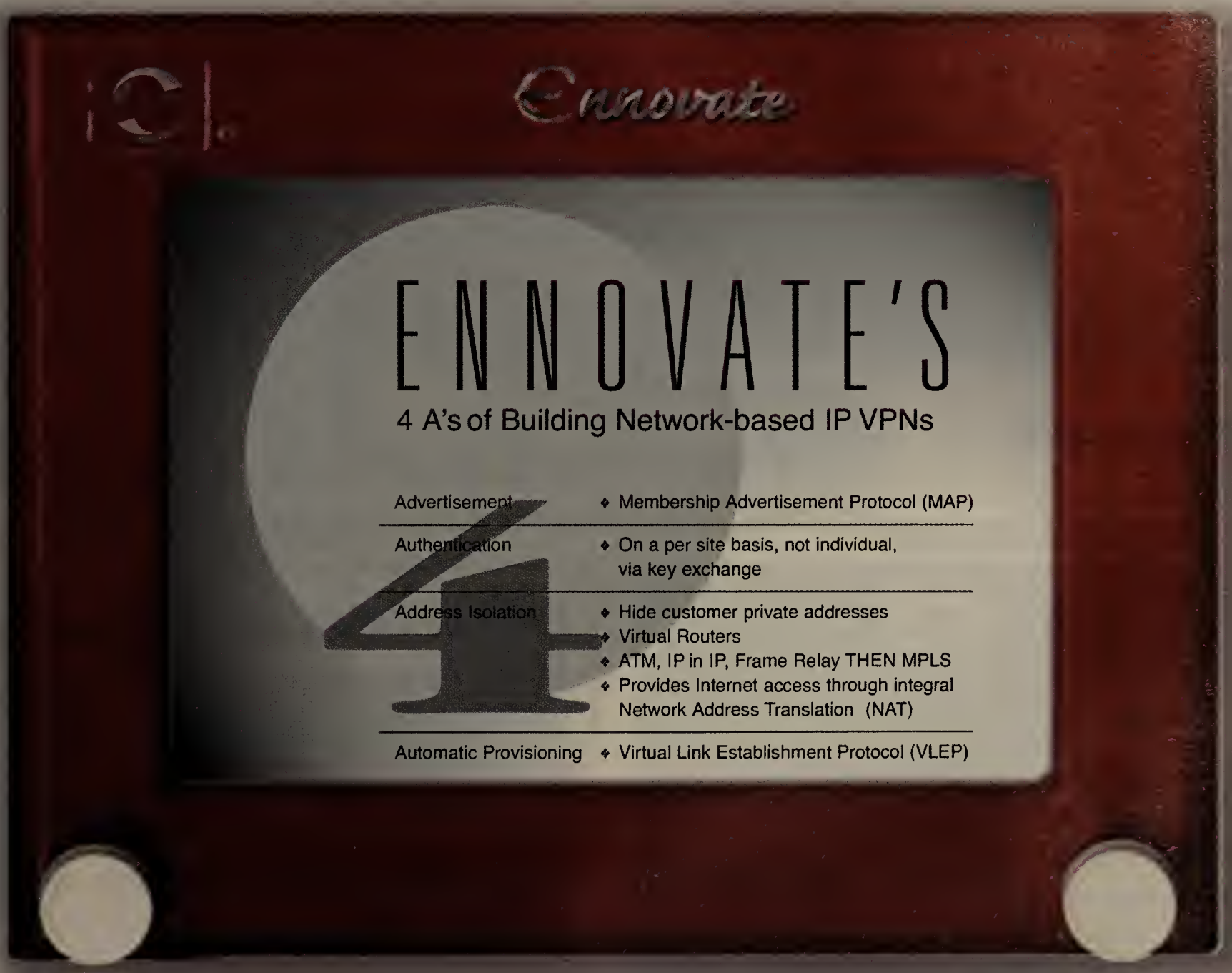

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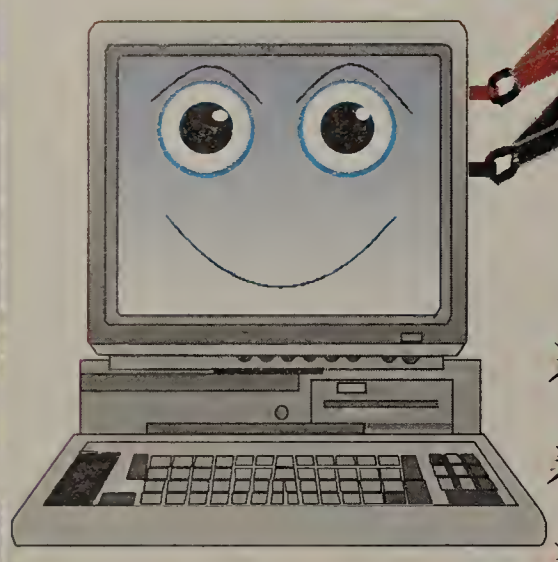

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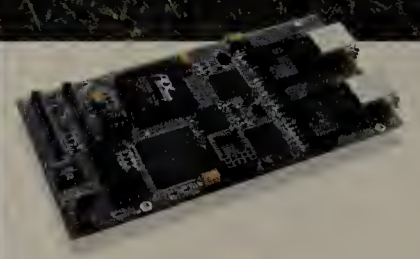

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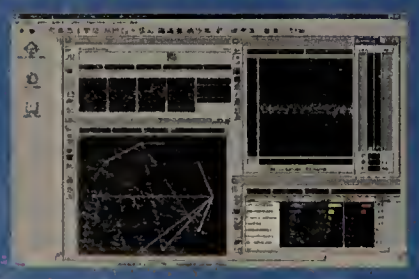

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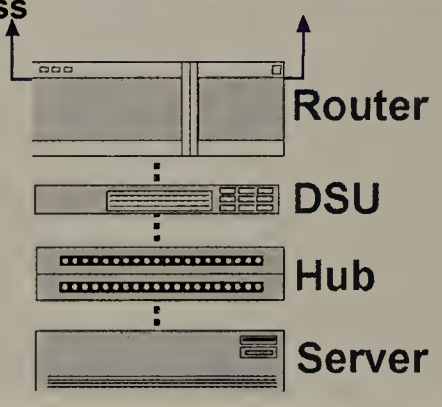

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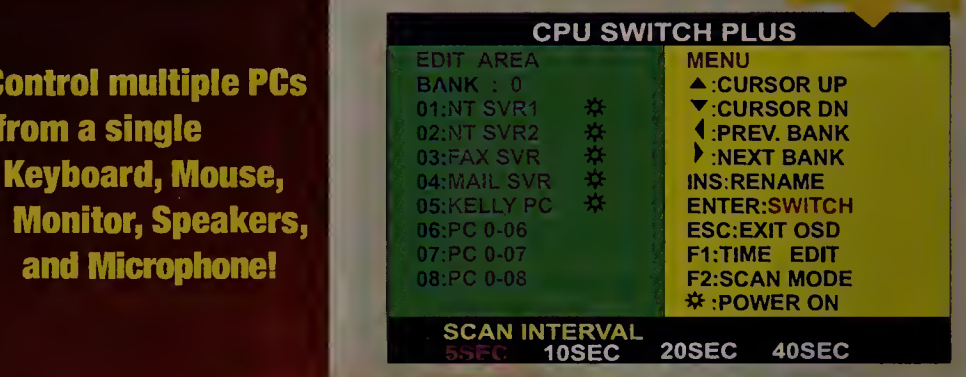

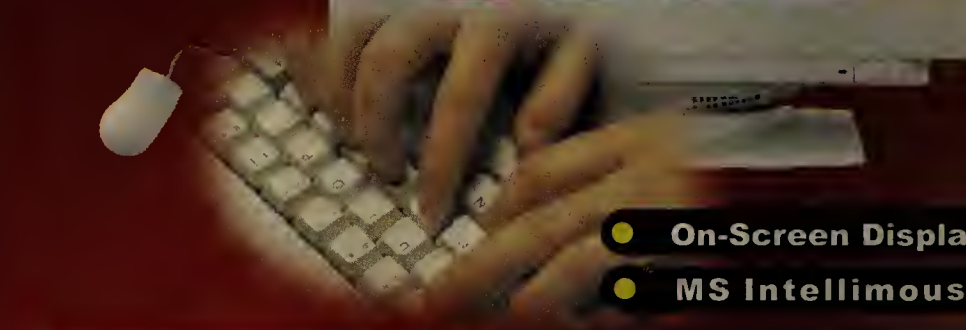

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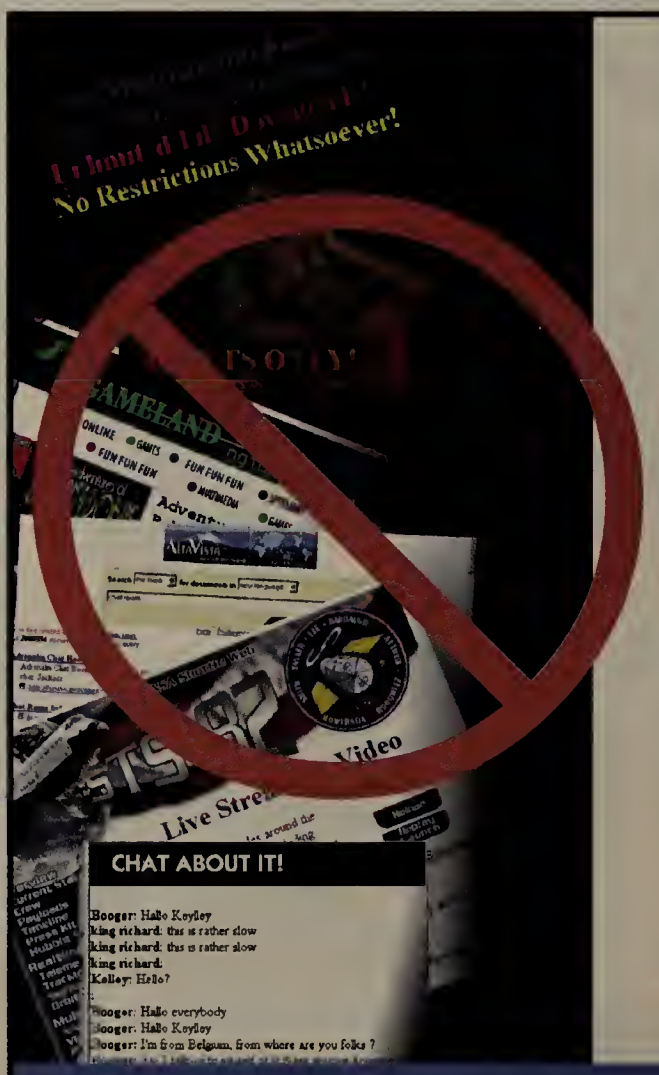

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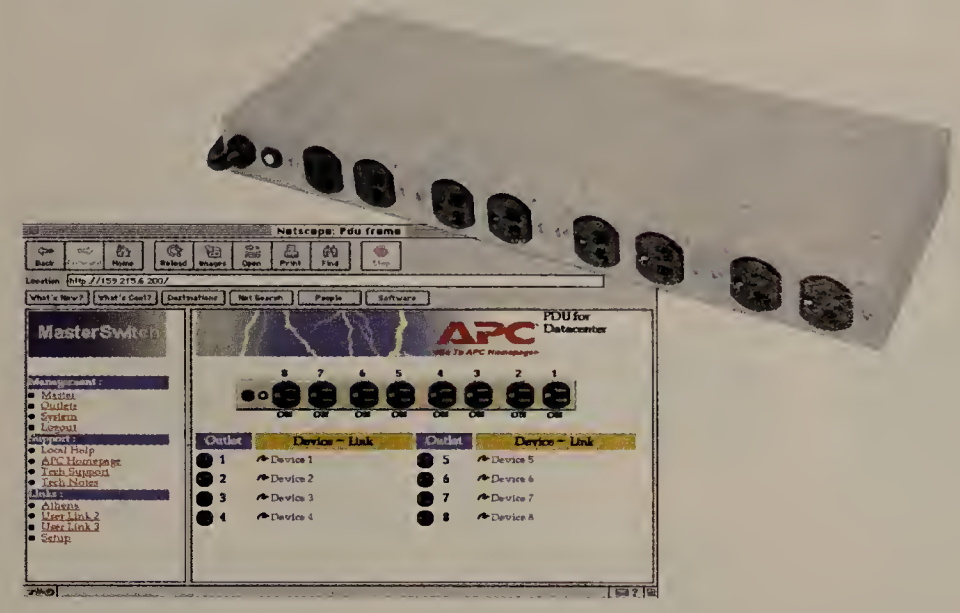

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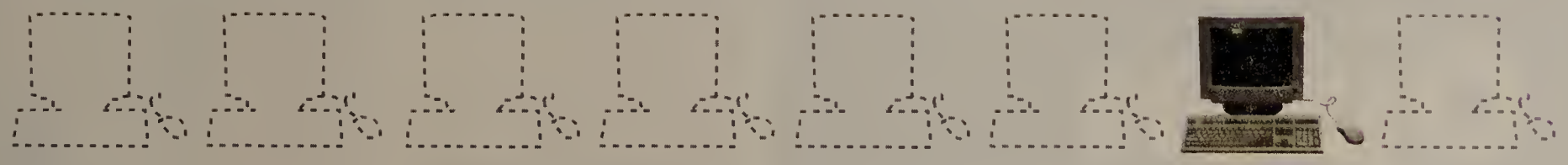

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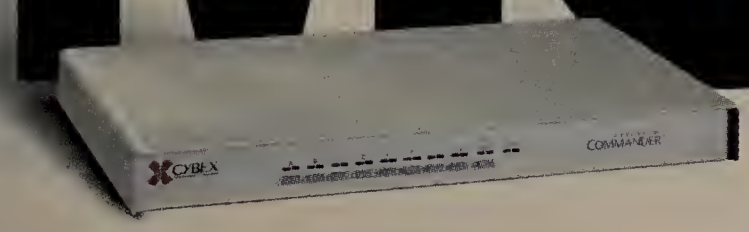

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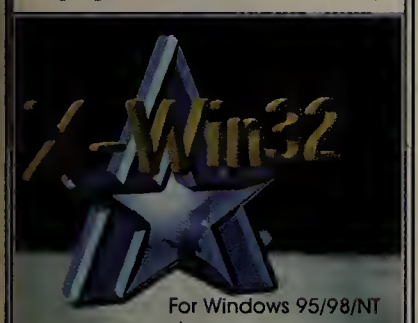

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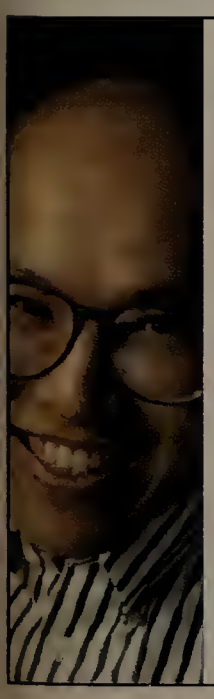

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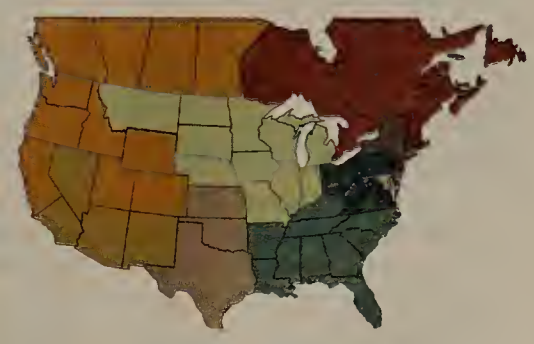

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Directories,
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Early adopters of Windows 2000 and Active Directory could learn a few things from the NDS users who went before them. Active Directory is supposed to ship by year-end.

NT users will face challenges similar to those that NetWare users encountered in 1993 when upgrading their network operating systems to include directory services. Directories are designed to simplify management of users, groups and devices on a net or across an enterprise.

"I see a lot of my NT clients going through the same thing my NetWare folks went through six years ago," says John Kretz, president of Enlightened Point Consulting Group in Phoenix. Kretz remembers some rough times, including culture clashes, training issues and technology snafus.

One major similarity between NDS and Active Directory is users must move from a relatively flat file system, with few interconnecting points, to a hierarchical "tree" structure made up of interwoven organizational units and user groups.

"The big confusion at first was ... we were using organizational units where groups were a better choice," says early NDS user Harold Valenzula, net administrator of Children's Home Society of California. Valenzula says his biggest lesson was that the tree design affected his whole IT organization. "Organizing the directory tree in NDS was difficult, and we only refined it through trial and error." He thinks Active Directory users will need to do the same.

While there are comparisons to be made, differences exist. Novell jarred users by making a wholesale technology change with NDS in NetWare 4.0, while Microsoft built Active Directory from NT 4.0's domain system. Microsoft users will have more third-party tools at their disposal. But Microsoft also faces higher expectations, and Active Directory will have to mature faster than NDS did while having less margin for errors.

"The big and ugly was understanding how the directory worked," says Peter Cruishank, network architect for the U.S. Navy and an early NDS adopter. "We had issues, including how to set up partitions, how sites fit in, how synchronization was happening and how to configure NDS to fit our operation."

Cruishank says another task was untraining administrators on NetWare 3 and binderies (NetWare files used for security and accounting) and re-training them on NetWare 4 and NDS. The issue forced Novell to release a transitional utility called Bindery Emulation Mode to make the dirctory look like a bindery.

Cruishank criticized Novell for the complexity of NDS and predicts users will find similar faults with Active Directory. "You have to think differently. If we pulled a server, we found it was still in the directory, and then we had to go back and painfully extract it. With the directory, it became a 3-D world," he says.

The change in thinking was hard on NDS adopters.

"If you had 500 servers, it was essentially taking 500 databases and consolidating them into one thing," acknowledges Brian Faustyn, director of product marketing for NetWare. "It was a radical shift and Microsoft is doing the same thing."

Now at NDS 8.0, which was released in April, Novell has ironed out the early problems.

Microsoft says it is savvy to the bumps that lie ahead.

"The real challenge will be for customers with multiple domains and consolidating those domains," says Peter Houston, lead product manager for Active Directory marketing. "Now you'll have to reconsider all those things that made you create multiple domains in the first place, like political issues and WAN links."

Houston says Active Directory also answers the two biggest complaints about NT 4.0: the need for multiple domains and limits in domain sizes.

Houston, however, believes comparing NDS growing pains with Active Directory challenges is apples to oranges.

"Novell made you migrate in a wholesale fashion," he says. "In Windows 2000, you can move incrementally and we'll give you the tools to do that."

Third-party vendors, including Entevo and Fast Lane, also will help manage the move.

To support development of directory-enabled applications, Microsoft last week released Active Directory Service Interfaces 2.5.

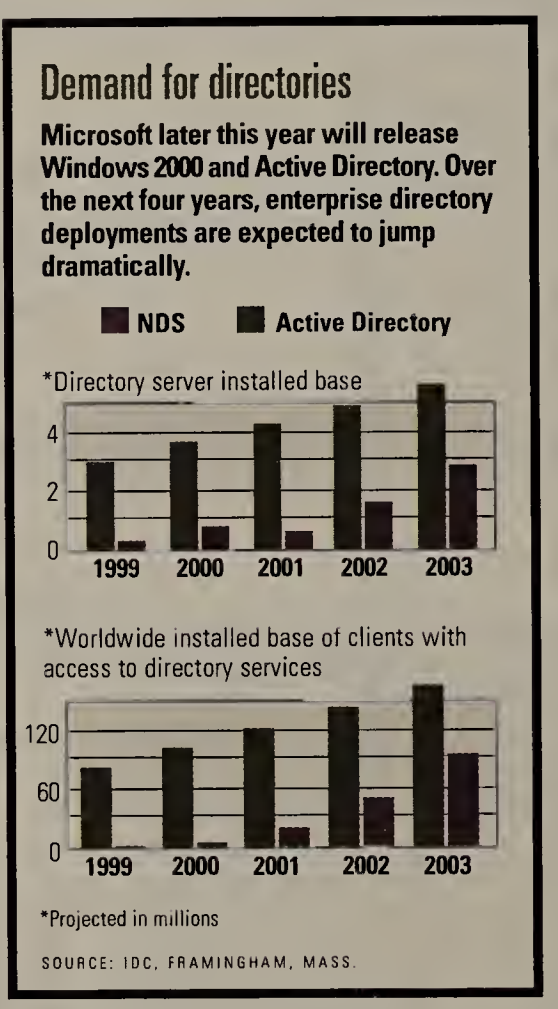
Some say Microsoft users will have other advantages.

"Active Directory will have it better than NDS in two ways: The lessons learned from history and NT 4.0 domains go half way toward top-down thinking," says Dan Blum, senior vice president of the Burton Group.

Blum says directories have to be built from the top of the organization down. Although NT domains are closer to that model than Novell was with its bindery, major work still has to be done. Enterprises will have to do a high degree of enterprise planning that will raise political and cultural issues, Blum says.

Regardless, Microsoft has little room for mistakes.

"If they don't get Active Directory dead right out the door, they will have big user issues," says Kretz of Enlightened Point Consulting. "They don't have the flexibility for errors Novell had when NDS shipped." ◪



SuperComm,
continued from page 1

are finally starting to deliver the gear that will provide faster carrier networks that are less expensive to build and run.

SUPERCOMM '99 Preview

Those networks will support new services such as:

- Voice-over-DSL, which offers 16 voice connections over a single telephone line with room left over for a data channel.
- DSL.Lite, which provides digital downloads at 1.5M bit/sec using a modem preinstalled in your PC.
- Passive optical networking (PON), which delivers 100M bit/sec fiber connections directly to your home.

Voice over DSL will be among the most visible technologies demonstrated at SuperComm, and carriers such as Rhythms NetConnections say they will sell services based on it by year-end.

The technology is suited to supporting voice and data needs of branch offices using just a single regular phone line. A single voice-over-DSL line carries multiple compressed digital voice channels, leaving bandwidth that can be used for data traffic, such as Internet access.

Voice-over-DSL vendors, including CopperCom and Jetstream, are announcing alliances to promote interoperability among their DSL voice equipment and other equipment located at customers' sites and carriers' switching offices.

Less exotic DSL will also get a boost with an interoperability demonstration of DSL.Lite, the easiest to install flavor of DSL. Some observers say DSL.Lite will fuel a boom in demand for the technology that will triple the number of DSL lines in use by next year. Regional Bell operating companies say they are ready to embrace the technology as soon as it hits the market.

More than 30 vendors plan to demonstrate that their gear will interoperate, making it possible to buy a PC with a DSL.Lite modem installed and plug the modem into any carrier's DSL.Lite line. Carriers will provision the service from their switching offices without visiting the customer site, much as they provision regular phone service.

Taking the idea of widely available broadband services a step further, BellSouth is introducing Fiber to the Home, a service capable of delivering 100M bit/sec fiber connections to houses.

Initially, the service will be offered to just 400 homes in the Atlanta area. But as BellSouth learns more about the technology supporting it — dubbed PON — the carrier may expand the service area.

PON technology shines a laser into a fiber-optic distribution network that starts with a single fiber and branches off into two, then four fibers and so on until the single fiber feeds 16 others.

For all the upbeat spin of the show, the appearance of new services will still come down to the carriers' bottom lines. ◪

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Cabletron,
continued from page 1

NetworkWorld Q&A

of our enterprise customers are trying to use service providers to augment their networks. So we've got to move in that direction. Piyush is more comfortable in that market.

Another thing is, in the Layer 3 space, we're No. 1. So we've come from a position where no one would consider us as a routing vendor, to being first place in that space in a year. That's pretty awesome, and that's what Piyush did.

The third reason is this company is still stigmatized by one person: Me. And that's not right.

There are 5,000 people that work hard here every day, and Cabletron should be given credit as an organization.

So it's time to make this company's image change from that of a one-person organization to that of [a company] of 5,000 people.

Did your board of directors think you were holding Cabletron back?

No. This is all my idea.

Three years ago, Cabletron was notorious for bashing routers. Do you find it ironic that you're now handing the reins to a former CEO of a router company?

We hated routers because ... we like to give customers products that last more than two years. To us, software-based routers were not able to handle voice and data. Hardware-based routers fix that.

You seemed resistant to selling the company when Wall Street thought a sale would be good. Did you actually turn away any potential suitors?

Wall Street has a quarter-to-quarter mentality. I founded this company. Selling the company is certainly one opportunity, but it's not the only opportunity.

I try not to do anything for the short term, but what's best in the long run — what's best for our customers, our employees and our shareholders, in that order.

What I believe is best for Cabletron in the long run may or may not include an acquisition, but certainly, you don't marry every single person you ever met.

As you look back, what are you most proud of?

Bob [Levine] and I started this without venture capital, and we did it as a cable business.

No one ever thought we could be a high-tech manufacturer. No one thought we could be successful selling against SynOptics in the late 1980s.

Then everybody thought we were crazy to do network management. We've got 450 patents; Cisco has 55. Patents by themselves aren't proof of innovation, but you have to develop it first in order to get a patent.

The [current thinking of many people] is that we can only be successful if we get acquired.

But I actually think it's a detriment to be a large company. Certainly you have deep pockets, but if you take three years to develop a product, you've lost the market opportunity. That's why all of these start-up companies are very successful. Cabletron is going to be intensely focused under Piyush's direction.

We've got $200 million invested in research and development, $600 million in the bank, no debt.... We're perfectly positioned to be innovative, fast-moving and able to take advantage of these opportunities that Internet speed has created.

What would you do over?

What I used to say was I was too young and stupid to know any better than I couldn't be successful at Cabletron. No venture capital, no business plan, a cable company — [there were] 10,000 manufacturers of cable back then and we were successful.

If I looked at the same set of circumstances now with the knowledge I have, I never would have started Cabletron.

What are you planning on doing now?

I was thinking of running for senator in New York against Hillary Clinton. I've never had more than one week off. I'm looking forward to spending some time with my family.

I'm still going to be a board member here. If Piyush wants any help, he has my phone number.

My old buddy Bob Levine is looking for a golf partner occasionally, so I can go hang with him. I'll find things to do. ◪

Look for a Q&A with new Cabletron CEO Piyush Patel in Network World next week.

Wall Street warnings

There is speculation that Cabletron's erratic stock performance over the past year may have been a factor in CEO Craig Benson's decision to resign from the company he founded.

PHOTO: SHAWN HENRY

> ***"This company is still stigmatized by one person: Me."***
>
> Craig Benson, former chairman, president and CEO, Cabletron

BENSON MOVE WINS PRAISE

Analysts and customers reacted to last week's departure of Cabletron Chairman, President and CEO Craig Benson with a mix of surprise and optimism.

"Overall it's good," says Craig Johnson, principal at the PITA Group in Portland, Ore. "The questions now become: Does this mean they're getting set up to sell the company? Without a strategic partner, what is it that they're actually going to try and do?"

Benson co-founded Cabletron in 1983 with the eccentric Robert Levine, who stepped down as Cabletron chairman in 1997. Benson and Levine built the company to $1.4 billion in annual sales, but Cabletron has been stuck at that figure for the past few years.

After losing market share to Cisco in the enterprise and following several lackluster and money-losing quarters, Benson fell into disfavor with Wall Street.

Though Cabletron won industry accolades for its bulletproof technology, Benson was criticized for lacking a coherent plan for company growth.

The pressure has been on Cabletron to regain enterprise market share and address hot new growth markets such as service providers and small and mid-size businesses.

Late last year, many Cabletron watchers were calling for a change of leadership at Cabletron, either through Benson's resignation or the sale of the company. Benson resisted both.

"Craig's a good guy and all but out of his league," says James Wiedel, director of networking in the computer services department at the University of Southern California in Los Angeles. "At some level, it probably feels better [that he is stepping down]."

Customers say they just don't want Cabletron to do anything too drastic to the company.

"In terms of the technology and the engineering of the products, they're great," says Mike Eldridge, director of telecommunications at Morehead State University in Kentucky. "We've always questioned the marketing. But at this point, we don't perceive the need to go into panic mode."

In a statement, Benson replacement Piyush Patel says his goal is to expand Cabletron's presence in the enterprise and service provider markets with an array of converged voice, video and data network products.

— Jim Duffy

Backspin

E-comm: Love, trust and doing wrong

"Love all. Trust a few. Do wrong to none."

— William Shakespeare

MARK GIBBS

I loved Amazon.com. I trusted it. And it did me wrong.

I was going to continue with last week's topic of talking to refrigerators but this, this . . . this betrayal demanded attention.

I've placed numerous orders with the company and had been happy with the interactions and service. But Amazon.com just blew it.

It all started a few months ago when I ordered a book from Amazon.com in advance of the publication date. A couple of hours ago, I received notification that the book had been shipped, and I was delighted.

The e-mail notification was brief, and it didn't say whether the book I'd ordered was a hardcover or a paperback, so I thought I'd check.

I went to Amazon.com and found the book's listing straight away (the company has always had excellent response times). There were two versions listed as I expected: the hardcover for $17.50 and the paperback for $11.20. Which was I about to receive?

Well, the price quoted on my order confirmation was $14 so I figured maybe it was a hybrid . . . a hardpaper coverback perhaps?

I checked my order history (another excellent response time) and found that I had ordered the paperback. I called Amazon.com's customer service department.

A pleasant young man answered quickly (these guys are fast) and checked my order (the speed made tears come to my eyes). He didn't know what to do and handed me over (very quickly) to an "order specialist," a charming young lady who (in short order) determined I hadn't been given the discounted price but rather the original publisher's price.

No problem — the company would credit my American Express card with the difference. Great, problem solved. Except . . .

It leaves the enormous problem that I no longer completely trust Amazon.com. Why? Because I wonder what other "mistakes" the company has made in my orders.

I pointed this out to the young lady who said she understood (I got the impression that she would rather I just said "thanks" and buzzed off — quickly — but I got the impression only fleetingly).

She said that perhaps she ought to report it as a problem to be fixed. "You're kidding," I said. "You mean that there was a chance that you might not have reported it if I hadn't questioned it?"

She (quickly) denied it, but I'm afraid I'm not convinced. After all, how often have customers spotted this kind of problem? Rarely, I suspect.

How often, when the problem has been reported, has the problem been escalated? I have no idea, but I have my suspicions that "none" is the answer. Now you might say this error was not a big deal, but I would have to disagree. In fact, the issue is not much different from the problem with telephone billing I discussed a few columns ago that got a lot of you fired up (*NW,* March 1, page 62).

Our online world is becoming increasingly friction-free. We are offered the carrot of warp-speed transactions and equally high-speed service to counter the stick of wasting our time on unimportant "stuff" and, therefore, we tend to accept these Teflon transactions as reliable.

As consumers, we have to keep a keen eye on every transaction because those little errors happen, I suspect, more often than we know. And they can cost us money — sometimes a lot of it.

As vendors, we need to examine our systems very carefully because mistakes such as this profoundly undermine our credibility. We want to have our customers love and trust us. Doing wrong like Amazon.com is all too easy, and once you've lost your customer's trust, well, that's the beginning of the end.

Error corrections to nwcolumn@gibbs.com.

'NET BUZZ

The latest on the Internet/intranet industry

PAUL MCNAMARA

Build a better mousetrap and the world will still beat mice to death with brooms if people can't find your invention on the Internet.

Jeffery Black, CEO of **iAtlas Corp.,** believes his Laurel, Md., start-up has exactly the type of search technology that will help business users weave their way through the Web's maze of lost links and pointless pointers.

According to Black, his company's InfoLens content filter and exhaustive database of online business information — purportedly culled from 8 billion data-mining queries — work in concert with search engine technology from Inktomi to give iAtlas-powered sites the oomph that others will envy. The difference is that iAtlas sorts data not only by key words, but also by business demographics: public vs. private, number of employees and geographic location. Adding these criteria yields more tightly focused results, he says.

"Our goal is to partner with all the big [search engine and 411 directory players] and take a small piece of all the transactions vs. trying to compete with everybody," says Black, formerly an executive at Alta Vista. The privately held company received start-up funding last year from Chestnut Partners, a Boston merchant bank, and will seek a second round shortly.

In addition to searches by subject, demographics and location, iAtlas can also bring you a list of every Web site owned by a particular company, with links to all kinds of pertinent — and useless — information. (Example: I learned that Microsoft has a site devoted to basketball player **Kareem Abdul-Jabbar,** www.kareem.com. . . . No, I do not know why.)

Black understands that skeptics smell a rat whenever vendors brag about search capabilities, but he also believes that those who try iAtlas will come away convinced. "Driving traffic to see the technology for the first time is probably the hardest thing to do," he says.

So we took that drive to www.iatlas.com.

A simple iAtlas keyword search on "accountants" turns up 157,190 all-but-useless hits, just as would be expected from any search engine.

Apply the iAtlas "Business Filter" for "accountants and tax services" in "a single location" with "less than 19 employees" and a new search turns up 286 hits. Not bad, but not particularly impressive either.

However, add an iAtlas "Geographic Filter" for the Boston area and, bingo, up pop 11 honest-to-goodness Bay State bean counters, including one a stone's throw from where this column is being typed.

Want to bet *that* accountant believes Black has built a better mousetrap?

NetIQ is a Microsoft parasite, and I say this in only the most complimentary manner about a company that just filed a **$46 million initial public offering (IPO).** NetIQ's AppManager software suite monitors and reports on the performance of Windows NT-based systems and applications.

There are plenty of reasons to believe that the IPO, as yet unscheduled, will be successful. NetIQ's customer list gleams with household names: AT&T, Dell, Charles Schwab, General Electric and Pfizer, to name a few. The company's products generally receive rave reviews from the trade press. And, the underwriters — Credit Suisse First Boston, BancBoston Robertson Stephens and Hambrecht & Quist — haven't earned their pinstripes backing chumps.

NetIQ hasn't made any money yet and can't say for sure when it will, but red ink hasn't steered too many investors away from technology stocks recently. The company also faces grown-up competition from IBM, Hewlett-Packard and Computer Associates, as well as all the uncertainty swirling around Windows 2000.

Still, this *should* net out to a fat IPO.

If not, we might look back and conclude that the offering was actually a sign of trouble for NT.

No search engine is necessary to find McNamara. You may send your Internet tips and gossip to him at (508) 820-7471 or pmcnamara@nww.com.

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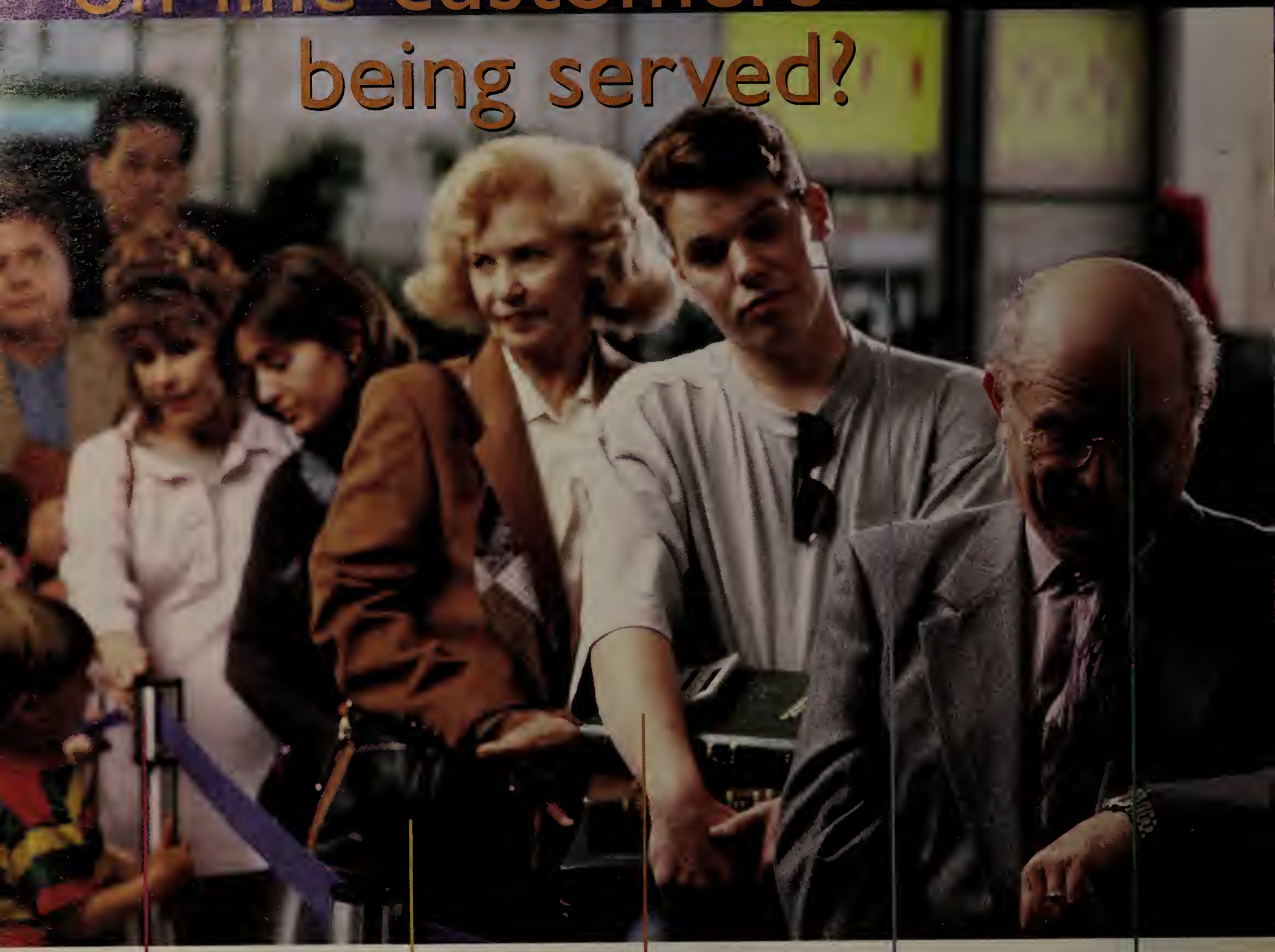

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